LOWER MURRAY WATER

2017 - 2066
Urban Water Strategy

URBAN WATER STRATEGY

Document control sheet

Version history

Version no.	Date	Changed by	Nature of amendment

Contents

Appendices

Executive Summary

Urban Water Strategy 2017 – 2066

This Urban Water Strategy for Lower Murray Water details a range of actions which will be implemented over a long term (50 year) planning period.

Lower Murray Water

Lower Murray Water (LMW) sources 97% of its water from the Murray River with the remainder from Goulburn Murray Water irrigation channel systems. A bulk water entitlement of 30,971 ML is currently specified under the Bulk Entitlement (River Murray - Lower Murray Urban and Rural Water - Urban) Conversion Order 1999 as at June 2011. LMW supplements the bulk entitlement with purchases of additional water share and allocation volumes and currently holds 1,460 ML of high reliability water shares. The total entitlement held by LMW in December 2016 was 32,431 ML.

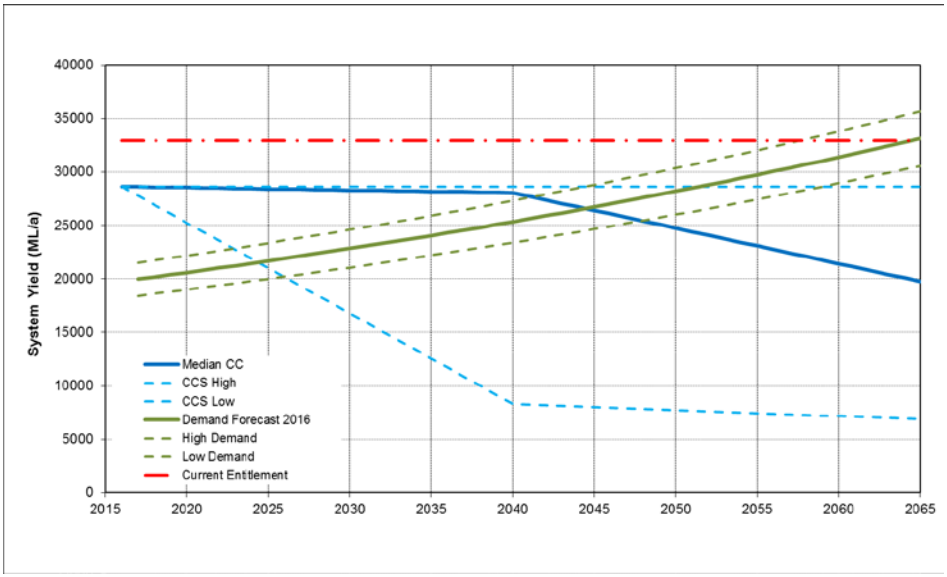
Based on the current total entitlement volume, the Murray system can supply 28,630 ML per year assuming a continuation of recent climatic conditions and 28,060 ML per year assuming a medium climate change scenario in 2040, based on the adopted annual reliability of 96%.

The current (unrestricted) demand is estimated to be 19,600 ML per year, based on the average annual demand over the three-year period 2013/14 to 2015/16. The number of residential customers within the region is forecast to increase from its current level of 29,300 to 38,300 by 2040 and to 51,000 by 2065. As a result, average annual demand is forecast to increase to 25,400 ML by 2040 and 33,100 ML by 2065.

The Supply-Demand Balance

A supply-demand balance based on a range of water demand forecasts and climate change yield scenarios is shown in Figure E1. The figure shows that for the baseline system yield (Median CC), there will be no supply shortfalls until about 2044 for the baseline forecast demand. Based on the baseline demand and yield forecasts, the supply shortfall in 2065 is around 13,400 ML, with a minimum of 1,900 ML and a maximum of around 28,800 ML.

Figure E1 Baseline Supply-Demand Balance for the Total System



Proposed Actions

This strategy has identified that the major uncertainty in Lower Murray Water's supply system relates to the impact on allocations resulting from climate change. The supply-demand balance highlights a wide range in future outcomes relating to supply. These outcomes significantly influence decisions to address the volume and timing of potential shortfalls.

Lower Murray Water's preferred action for securing the region's water supply will focus on the purchasing of additional water share and allocation volumes from the water market. This provides a flexible and cost-effective approach to balance future supply and demand. Based on customer input, Lower Murray Water has committed to purchasing 360 ML of entitlement per annum, commencing in 2017/18. A range of complementary actions which will offset the impacts of potential future shortfalls have also been identified as part of the strategy.

The action plan presented in Tables E1 and E2 outlines the key actions which will be pursued by Lower Murray Water to balance supply and demand over the period to 2066. In particular, the action plan informs key works during the next Water Plan period (2018/19-2022/23).

Table E1 Preferred Action for Securing Water Systems

Action	**Timing of implementation and volume of water provided (ML/year)**			
Purchasing Additional Water Entitlement	2017	2030	2040	2066
To maintain a 50% buffer between annual usage and the amount of entitlement held, Lower Murray Water will purchase 360 ML of entitlement per annum.	360	360	360	360

Table E2 Complementary Actions Securing Water Systems

Action	Benefits
Reducing Demand for Potable Water	
Lower Murray Water will continue to maintain a focus on water efficiency and awareness by supporting a range of efficiency measures across its supply systems to reduce per capita consumption. These will include education programs within schools, water efficiency programs and rebates, supporting community groups and clubs to participate in alternative water supply options. There will be a strong focus on digital education programs with emphasis on access by a wide range of cultures and backgrounds.	Will minimise increases in climate sensitive demand under climate change conditions
Improve use of existing supplies	
Lower Murray Water will improve metering and monitoring of its supply system to ensure system losses are maintained at best practice standards.	Reduced raw water diversions from River systems
Lower Murray Water will actively manage carryover to maximise system reliability during dry periods.	Mitigate risk of requiring restrictions or need to purchase water allocation during dry periods
Alternative Water Sources	
Lower Murray Water will continue to work with the community to identify cost-effective opportunities for the utilisation of alternative water. Current use and opportunities will be communicated via the alternative water maps.	Fit for purpose supplies, reducing potable water demand.

1 Introduction

1.1 Purpose of an Urban Water Strategy

Urban Water Strategies, previously known as Water Supply Demand Strategies (WSDS) are prepared by Victorian Water Corporations every five years as a requirement of their Statement of Obligations. The 2017-2066 Urban Water Strategy details a range of actions which will be implemented over a long term (50 year) planning period to ensure urban water customers continue to receive a reliable water supply.

This 2017-2066 Urban Water Strategy has been developed in accordance with guidelines issued by the Department of Environment, Land, Water and Planning, and addresses key *Water for Victoria* actions. The guidelines state that the purpose of Urban Water Strategies is to identify the best mix of measures to provide water services in our towns and cities now and into the future. Urban Water Strategies:

- Have a long-term outlook of 50 years; and
- Contain actions which:
    - Consider the total water cycle, consistent with the principles of integrated urban water management;

- Support the development of resilient and liveable communities;
- Balance social, environmental and economic costs and benefits; and
- Take account of the consequences and uncertainty associated with population growth and climate change and climate variability.

The principles behind the development of an UWS are:

- Specific, quantifiable and measurable criteria should be used to describe and monitor system performance in terms of levels of service.
- Planning must be prepared for a range of possible futures – by making sure that systems could cope with a relevant continued dry sequence as well as the potential for a range of possible climate futures, i.e. "reduce the likelihood of surprises".
- A "no regrets" approach to taking action should be taken – by doing those things that make the most sense under a range of planning scenarios.
- Customers should be involved in decisions about cost/risk trade-offs – by describing how each system would perform under a range of scenarios and what would be the cost of improving performance.
- Planning should recognise that water issues and opportunities are not uniform across the State.

Lower Murray Water last developed a WSDS in 2012. Since this time, Lower Murray Water's supply systems have recovered from the severe drought conditions experienced during the Millennium Drought (1997-2009) which resulted in low water allocations across the River Murray supply system and customers being impacted by periods of severe water restrictions.

This 2017 to 2066 Urban Water Strategy refines the actions identified in 2012.

1.2 Overview of Lower Murray Water

Lower Murray Water is responsible for the provision of urban and rural water supplies to an area in the north west of the state from Kerang to the South Australian border. Mildura is the largest city supplied in the region (refer Figure 1).

On 1 July 2004, the Lower Murray Urban and Rural Water Authority was created under the provisions of the *Water Act 1989*, assuming the functions, powers and duties under the *Water Act 1989* of the Lower Murray Region Water Authority and the Sunraysia Rural Water Authority. On 19th August 2008, Lower Murray Water took over the functions, powers and duties of the First Mildura Irrigation Trust.

Lower Murray Water provides:

- Urban water services to 14 townships via nine treatment plants to approximately 74,000 people along the Murray River in Victoria from Kerang to Mildura;
- Wastewater collection, treatment and effluent re-use and disposal services to 11 towns via 10 treatment plants;

- River quality water services to 4,964 customers in the four pumped irrigation districts of Merbein, Red Cliffs, Robinvale and Mildura, the Millewa rural district and some areas of the waterworks district of Yelta;
- Management of the region's rural bulk water entitlement of 343,081ML;
- The collection and disposal of subsurface drainage water from the four pumped irrigation districts, and Nangiloc, Robinvale and Boundary Bend private diverters;
- Ensuring irrigation and drainage designs in new agricultural developments conforms with salinity management plan development guidelines;
- Management of the private diversion licences of 1,161 water users along the Murray River in Victoria between Nyah and the South Australian border;
- The assessment and approval of water share and allocation trade applications; and
- Reclaimed water for third party use.

Figure 1 Lower Murray Water Supply Region

1.3 Lower Murray Water Goals

While Lower Murray Water provides services for both urban and rural uses, the UWS relates primarily to the urban supply systems. The UWS for the urban supply systems will form one of a number of tools aimed at meeting Lower Murray Water 's corporate goals:

Our priorities and actions derive from our mission, corporate and governance strategies.

Mission	Corporate Strategies	Governance Strategies
Provide water services in a sustainable, reliable and timely manner	Be customer focused *'Right Service, Right Time'*	Manage the Corporation in accordance with expected standards of corporate behaviour
Maintain positive and transparent relationships with our customers and other stakeholders	Maintain compliant performance while improving cost-effectiveness of operations and assets	Manage our assets and finances responsibly and sustainably
Contribute to the economic, social and cultural development of our region	Increase use of the modernised irrigation infrastructure in the four districts	Provide an engaged and skilled workforce to deliver our vision and mission
	Increase the resilience of services to changing and extreme weather	Provide our services equitably and with consideration

The key water resource management activities that have informed the development of the UWS and contribute towards Lower Murray Water achieving the above objectives include:

The **Urban Water Restrictions By-Law No 2** (February, 2012) provides the regulatory framework prescribing four stages of restrictions and prohibitions on the use of water that can be mandated by Lower Murray Water when it is considered necessary to conserve water.

Lower Murray Water's **Permanent Water Savings Plan** encourages efficient use of water on an on-going basis by maintaining a common-sense approach to water use

The Corporation's **Drought Preparedness Plan** (DPP) details practical approaches for system operating during periods of water shortage. The purpose of a DPP is to detail management actions to meet critical human needs during an extreme dry period, or a water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values. The DPP is included as Appendix A of this Urban Water Strategy.

The actions contained in the Victorian Government's ***Water for Victoria*** have helped to inform the development of this strategy.

2 Development of the Strategy

2.1 Urban Water Strategy Objectives

In developing the UWS, Lower Murray Water aims to:

- Ensure safe, secure, reliable and affordable water and sewerage services that meet our region's long term needs;
- Encourage the sustainable use of water resources – including rainwater, stormwater and recycled water and rainfall-independent supplies in ways that are efficient and fit-for-purpose, whilst ensuring that public and environmental health are protected;
- Enhance the liveability, productivity, prosperity and environment of our towns;
- Ensure that the water needs of environmental assets within the Mallee Region are transparently considered; and
- Provides for a transparent and rigorous decision-making process, with clear roles and responsibilities and accountabilities, which can adapt to the changing environment.

To facilitate a more integrated short to longer term planning approach, the UWS has been developed in parallel to the update of Lower Murray Water's Drought Preparedness Plan, and is a key component of the development of the Corporations' Water Plan (Pricing Submission) 4 (2018/19 to 2022/23). It is intended that the UWS will be reviewed every five years.

2.2 Urban Water Strategy Targets

A range of targets have been identified to guide the UWS development and meeting the identified strategy objectives. Some of these targets (such as supply and level of service targets) have been developed as part of the UWS development process, while others (such as the determination of acceptable tariffs) will be guided by the Water Plan 4 process.

Supply and Demand Targets

The key target for the UWS is to balance forecast supply and demand over the 50 year planning period, but particularly over the Water Plan 4 period (2018/19 to 2022/23).

Level of Service Targets

Level of service targets provide an indication for customers of the performance they can expect from their water supply, related to the tariffs they are being charged for the service.

Cost and Revenue Targets

As part of the development of the 2017-2066 UWS, Lower Murray Water will focus on cost-effective supply and demand options to balance forecast supply and demand over the 50 year planning period. Targets for cost, revenue, and tariffs will be developed by the Lower Murray Water Board and Management, through consultation with customers and the Essential Services Commission.

2.3 Level of Service Standards

Level of service standards for Lower Murray Water's supply systems have traditionally been expressed in terms of supply reliability:

- 96% annual supply reliability; or
- Stage 1 restrictions no more than 1 year in 25.

Lower Murray Water proposes to maintain this level of service standard, with a focus on mitigating the requirement to implement severe water restrictions on customers.

2.4 Development of the 2017 -2066 Urban Water Strategy

Lower Murray Water last developed a WSDS in 2012. Since this time, Lower Murray Water's supply systems have recovered from the severe drought conditions experienced during the Millennium Drought (1997-2009) which resulted in low water allocations across the River Murray supply system and customers being impacted by periods of severe water restrictions.

Development of Lower Murray Water's 2017-2066 UWS commenced in 2016, with the activities completed summarised in Table 1.

Lower Murray Water's 2017-2066 UWS has been developed in consultation with the community, our customers and key stakeholders, and the LMW Board. Lower Murray Water's UWS Project Team together with the Customer and Stakeholder Team has actively participated in consultation and engagement with key stakeholders and the community to help shape and influence LMW's UWS. A summary of the community and stakeholder engagement for the UWS can be found in Section 9 of the strategy.

As part of the ongoing commitment to engagement and consultation with customers and stakeholders, Lower Murray Water will continue to engage with the community on several areas identified in the UWS and the Pricing Submission. This approach is consistent with our Customer Experience Strategy processes.

Table 1 Summary of Strategy Development Activities

Activity	Related Information/Documents
System Descriptions	Lower Murray Water Drought Preparedness Plan (Appendix A)
Review of current status of water consumption across all supply systems	Lower Murray Water Annual Reports (2006-2016) Lower Murray Water Drought Preparedness Plan (Appendix A)
Forecast of water demands to 2065	Lower Murray Water Annual Reports (2006-2016) Victoria in Future Population Projections (2016)
System yield assessment and forecast supply to 2065	DELWP Murray System REALM Modelling DELWP Climate Change Guidelines (2016)
Identification of options for securing the region's water supply	Review of previous options developed in LMW 2012-2060 WSDS

Customer consultation	Consultation & Engagement Strategy (Appendix C) Indigenous Engagement Plan (Appendix D)

3 Urban Water Supply and Wastewater Systems

3.1 Climate of Supply Region

The Lower Murray Water region is one of the driest regions in Victoria receiving an average annual rainfall of about 300 mm in comparison to the 400-600 mm of rainfall received per year in most other non-alpine regions of Victoria. In addition, the region experiences about 1,800 mm of evaporation per year on average, compared to 1,400 mm or lower experienced in other regions. The longer days and generally drier climate significantly influences water consumption and the community's dependence on reliable water sources. Climatic conditions compared to other regions of Victoria are illustrated in **Figure 2**. **Figure 3** shows an annual time series of Victorian rainfall, demonstrating the high inter-annual variability in the State's rainfall.

Figure 2 Average Annual Rainfall Across Victoria

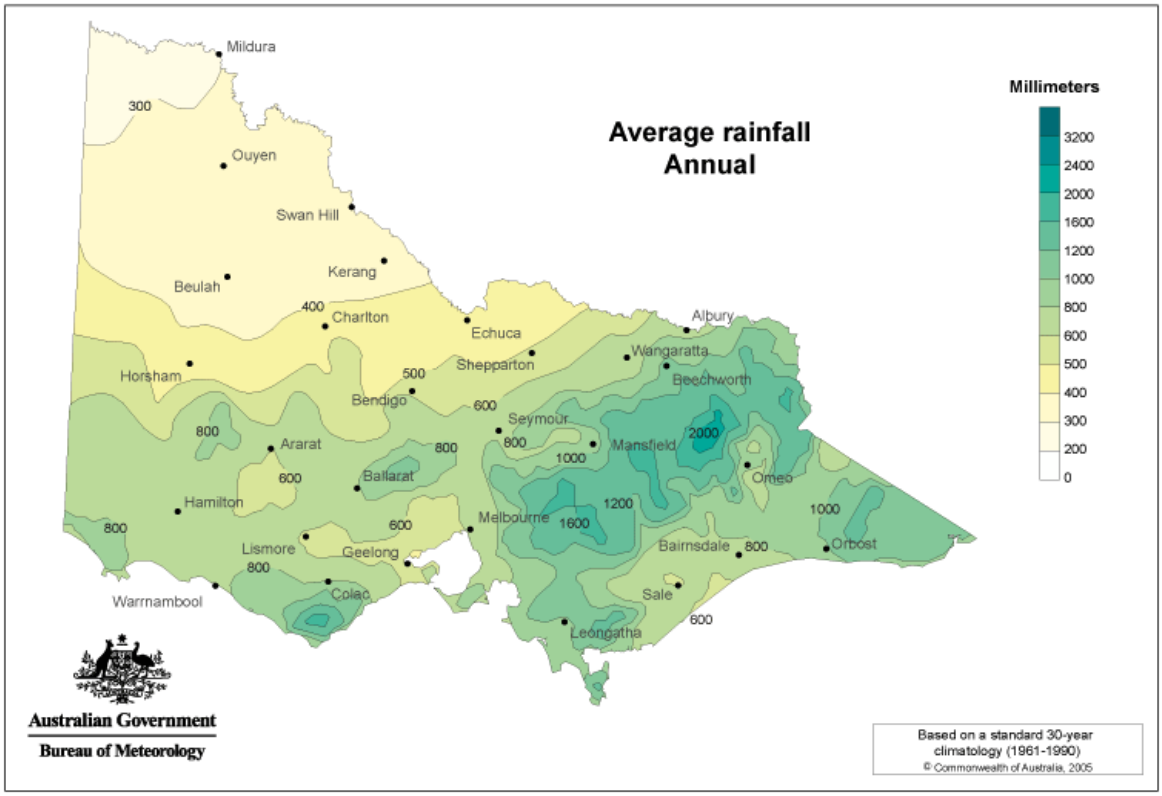
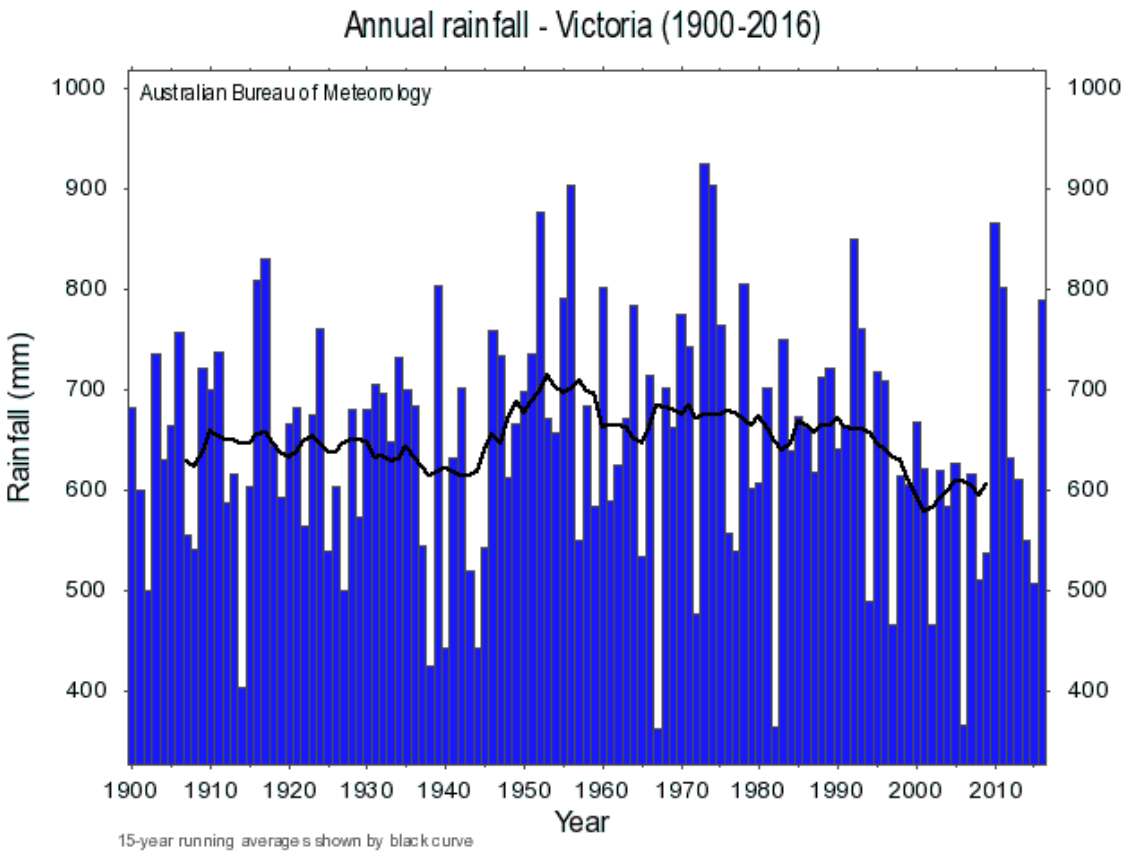


Figure 3 Annual Victorian Rainfall



3.2 Water Supply System Descriptions

Lower Murray Water services 14 town water supplies/zones from the Murray and Loddon River systems, operating and managing eight independent supply networks (refer **Error! Reference source not found.**):

- Mildura System, including Merbein
- Kerang System
- Red Cliffs System
- Piangil System
- Robinvale System
- Koondrook System
- Murrabit System
- Swan Hill System, including Nyah/Nyah West, Lake Boga and Woorinen

Each of these systems is described below.

Mildura

Water is pumped from the River Murray at Mildura through two conventional water treatment plants. The treated water is supplied to around 21,000 connections in the City of Mildura and

surrounding rural-residential areas including the townships of Irymple, Merbein and Cardross. The Seventh Street treatment plant is designed for a capacity of 85 ML/d and the Mildura West plant has a capacity of 20 ML/d.

The average daily consumption for the summer months is normally below 50 ML/d with occasional consumption in excess of this. Treated water pumping stations at Seventh Street and Mildura West distribute water to two water towers with a combined storage capacity of 3.03 ML. Additional booster pump stations and ground level storages with a combined storage capacity of 37.6 ML allow the system to maintain pressures to the outlying areas on days of higher demand.

Merbein is supplied with treated water from the Mildura treatment plant via a 450 mm diameter transfer pipeline some 7.14 km long. The pipeline transfers water directly to the Merbein reticulation that includes a ground level storage of 7.5 ML capacity. During times of high demand, booster pumps of 150 L/s (13 ML/d) capacity, pump from the storage directly into the reticulation system to maintain optimum pressures.

Red Cliffs

The town of Red Cliffs (14 km south of Mildura) is an independent system, and services around 1,700 connections. A pumping station extracts water from the River Murray through a dissolved air flotation treatment plant to a 6 ML ground level storage. The treated water is delivered to a water tower near the town centre. Two rising mains of 300 mm and 375 mm diameter. The plant design capacity is 9.5 ML/d and the average daily consumption during the summer months is usually below 6.0 ML/d.

Robinvale

The town of Robinvale pumps water from the River Murray via a 300 mm pipeline to a conventional water treatment plant, which services around 1,000 connections. The maximum plant design capacity is 6 ML/d, with an average peak daily consumption during the summer months of approximately 4.0 ML/d, from a 3.6 ML ground storage and 0.3 ML water tower.

Kerang

Kerang is situated at the southern end of the Lower Murray Water region. Water is pumped either from the Loddon River, the River Murray (at Koondrook) or the Goulburn Murray Water 14/2 Channel and treated in a conventional treatment plant, which services around 2,100 connections. The maximum plant design capacity is 16.6 ML/d and average peak daily consumption has reached 7.2 ML/d during some summer periods.

Piangil

At Piangil, water is pumped from the River Murray to a "Package" conventional water treatment plant which services around 100 connections. The plant has a capacity of 0.7 ML/d. Treated water is then pumped to the existing 1.14 ML ground storage, situated on a high ridge east of the town. From this storage, the system is re-pressurised by pressure booster pumps for distribution into the town's reticulation network.

Koondrook

Water is pumped from the Murray River to a conventional water treatment plant with a capacity of 3 ML/d. An above ground water storage of 2 ML and standpipe of 0.9 ML services around 500 connections .

Murrabit

The Murrabit system can pump water both from a Goulburn-Murray Water channel and the Murray River to a conventional water treatment plant of 0.2 ML/d. Treated water pumps supply a 50 kL high level storage which services over 50 connections.

Swan Hill

The Rural City of Swan Hill is situated in the centre of the southern region of LMW. Raw water is pumped from the River Murray at Swan Hill to a conventional filtration and disinfection system with a capacity of 35.6 ML/d. The Swan Hill system also supplies Woorinen South, Nyah & Nyah West and Lake Boga, which together service around 7,000 connections. The average daily consumption is normally below 23 ML/d for this system. Treated water pumps deliver treated water to a 2.27 ML ground level storage and 0.68 ML water tower near the city centre. Two extra ground level storages, each of 4.0 ML capacity, and a 0.15 ML water tower are situated west of the city.

Woorinen South is supplied from Swan Hill system via a 10 km long 300 mm diameter pipe system together with a 2.0 ML ground level storage and associated re-lift pumps and chlorination facilities.

The townships of Nyah and Nyah West are supplied via a 27 km long, 300 mm diameter pipeline from the Swan Hill Water Treatment Plant. A 6 ML ground level storage, chlorination facility and re-lift pumps are situated at Nyah. Properties adjacent to this pipeline are able to access water for domestic or commercial supply.

Lake Boga is supplied via a 250 mm diameter pipeline from the Swan Hill Plant. A 0.9 ML ground level storage, chlorination facilities and 0.1 ML water tower together with associated re-lift pumps have been installed to maintain pressures on days of high demand.

3.3 Sources of Supply

Lower Murray Water sources about 97% of all raw water in the region from the River Murray, with about 3% (on average) being supplied from the Loddon River and G-MW Channel System. All water is accessed via water entitlements. Lower Murray Water currently holds a bulk entitlement and water shares.

The quantity of water that Lower Murray Water can divert from each supply source for its urban systems is specified in the Bulk Entitlement (River Murray - Lower Murray Urban & Rural Water - Urban) Conversion Order 1999 - Consolidated as at 29 June 2011.

The maximum annual diversion limit specified in Lower Murray Water's urban Bulk Entitlement is 30,971 ML, of which 29,011 ML has been nominated to be extracted from the River Murray and 1,960 ML nominated to be diverted from the Goulburn-Murray Water supply

channels. Offtake points and limits on the maximum daily diversion rates are specified in Schedule 4 of the Bulk Entitlement, a summary of which is provided in **Table 2**.

Table 2 Lower Murray Water Bulk Entitlement and Diversion Limits[1]

Water Supply System	Nominated volume per year (ML)[1]	Waterway/Channel	Offtake Point	Maximum Diversion Rate (ML/d)
Koondrook	293	River Murray	Koondrook Pump Station	3.7
Murrabit[3]	58	Channel No 2/11/4	Metered Outlet No 4266A	5.0
Kerang	1,700	Loddon River – supply by G-MW Channel 14/2	Kerang Pump Station	13.0
			Pump Outlet 2542	19.0
	200	River Murray	Koondrook – Kerang pipeline	3.7
Swan Hill	4,498	River Murray	Swan Hill Pump Station	29.0
Woorinen	231	River Murray	Linked to Swan Hill	see above
Nyah West[2]	275	Channel No. 1/7/2	Metered Outlet No. 8238	5
Nyah[2]	200	River Murray	Nyah Pump Station	2.5
Piangil	95	River Murray	Piangil Pump Station	1.0
Robinvale	702	River Murray	Robinvale Pump Station	6.0
Red Cliffs	1,410	River Murray	Red Cliffs Pump Station	9.5
Mildura	12,284	River Murray	Mildura Pump Station	122.0
Total	21,946			

1. The amount of water taken for each individual system can be varied, provided the total water allowed (taking into account any seasonal restrictions) is not exceeded.

2. Nyah and Nyah West now take water from Swan Hill.

3. Murrabit now has river off take from the River Murray.

NB: Nominated Volume per year of 21 946 ML is no longer relevant as replaced by volumes in Schedule 1 of BE Order.

The original bulk entitlement which was established in 1999 provided a maximum annual diversion volume of 21,946 ML. During the period 1999 to 2007, population growth and drier than average climatic conditions resulted in the annual demand exceeding the original volume. Lower Murray Water therefore needed to secure supplies through the purchase of additional water shares, with a total volume of 9,025 ML of water share purchased during this period. In 2010/11, the combined volume held by Lower Murray Water (30,971 ML) was consolidated into high reliability water entitlements.

Water Shares

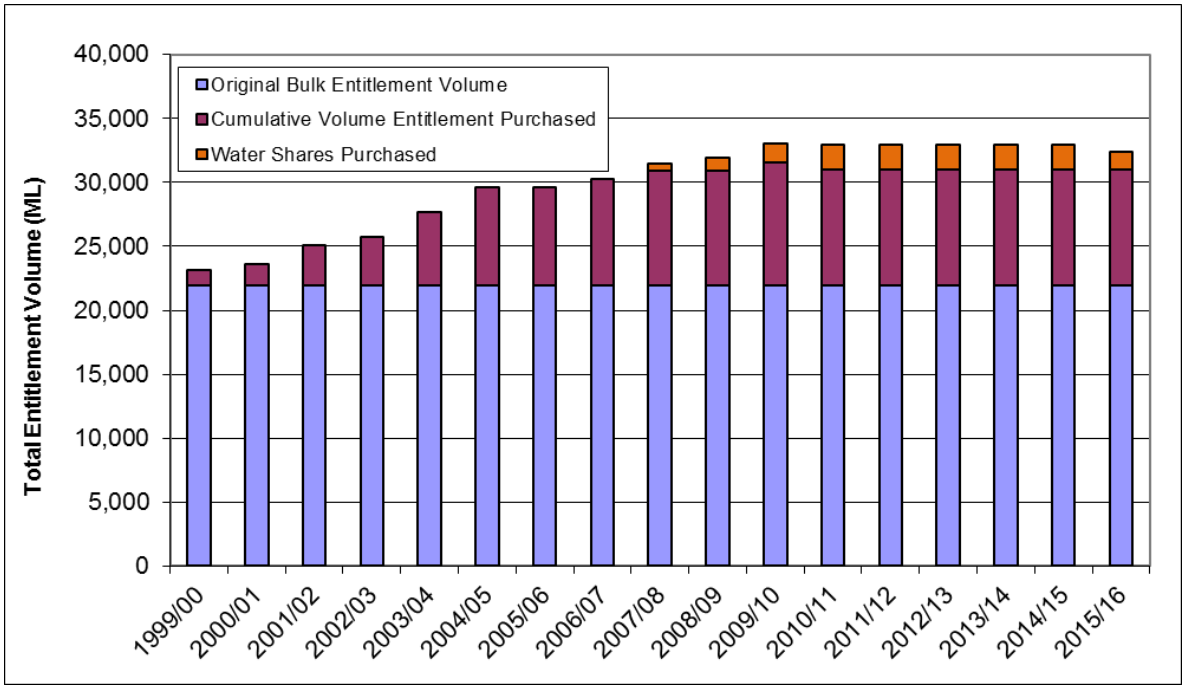
In recent years, low allocations across the Murray System have resulted in the need for Lower Murray Water to purchase additional water entitlements, with a total of 1,460 ML of high reliability water shares having been acquired since 2007/08. Between 2007/08 and 2010/11,

almost 10,100 ML of allocation water was purchased in light of continued dry conditions and another year of low allocations.

Summary of Water Entitlements

A summary of entitlements and water shares held by Lower Murray Water is provided in Figure 4. Lower Murray Water currently holds 32,431 ML of high reliability entitlements.

Figure 4 Lower Murray Water Entitlements



Access to Carryover

The carryover rules that apply to Lower Murray Water's urban supply system allow unused allocations at the end of the year to be taken in the following year/s. At the start of each year, the volume of allocation carried over and above entitlement volumes is quarantined in a spillable water account. This water is not available for use or trade until a declaration of low risk of spill is made. If a spill is determined to have occurred in the system, some or all of this water is lost. Carryover is designed to provide added reliability and operational flexibility during dry periods for entitlement holders such as Lower Murray Water.

3.4 Wastewater System Descriptions

Lower Murray Water provides wastewater collection, treatment and effluent re-use and disposal services to 11 towns via 10 treatment plants.

The wastewater treatment plants are listed below and shown in **Figure 1**.

- Koorlong WWTP & Re-use Complex - This treatment plant services approximately two thirds of the Mildura residential area, the township of Irymple, including major trade waste from this area and trade waste from a fruit and vegetable processing operation in

Merbein. The treatment process is based on the Sequencing Batch Reactor activated sludge process where class C reclaimed water for irrigation is achieved.

- Mildura WWTP - this is an extended aeration activated sludge plant based on the carousel system, servicing a population of approximately 17,000. All the treated wastewater is reused on site irrigating both pasture and tree plantations.
- Kerang WWTP - is a lagoon based treatment plant, servicing a population of approximately 4,000. The treated wastewater is recycled back into the water cycle by evaporation.
- Koondrook WWTP - is a lagoon based treatment plant, servicing a population of approximately 850. The treated wastewater from this plant will be reused on-site for pasture/fodder production.
- Lake Boga WWTP- is a lagoon based treatment plant, servicing a population of 700. The treated wastewater is recycled back into the water cycle by evaporation.
- Merbein WWTP - is a lagoon based treatment plant, servicing a population of approximately 1,800. The treated wastewater is recycled back into the water cycle by evaporation.
- Murrabit WWTP - is a lagoon based treatment plant, servicing a population of approximately 100. The treated wastewater is reused irrigating the Murrabit recreation reserve.
- Nyah West WWTP - is a lagoon based treatment plant, servicing the townships of Nyah and Nyah West with a combined population of approximately 885. The treated wastewater is recycled back into the water cycle by evaporation.
- Robinvale WWTP - is a lagoon based treatment plant, servicing a population of approximately 1,800. The treated wastewater is reused on-site irrigating lucerne.
- Swan Hill WWTP - is a lagoon based treatment plant, servicing a population of approximately 10,000. The treated wastewater is recycled back into the water cycle by evaporation.

The inclusion of wastewater planning in the Urban Water Strategy addresses Action 5.4 of *Water for Victoria*.

3.5 Water Quality and River Health

We strive to achieve healthy rivers, streams and floodplains through our own works and by supporting our partner agencies.

We work with the Mallee Catchment Management Authority (MCMA) to provide environmental water delivery under the Victorian Environmental Water Holder (VEWH) Seasonal Watering Plans. Under the direction of MCMA we use our irrigation and drainage assets to provide water to various regional wetlands and floodplains in order to maintain and improve their environmental health. During the 2015/16 period, we delivered 953.6 ML to Cardross Basins and 506.8ML to Lake Hawthorn. In addition, 18ML of outfall water was supplied to Lake Koorlong.

The Mallee Waterway Strategy 2014-22, released by the MCMA in 2014, sets priorities for the management of key assets and of threats associated with the waterways in the Mallee Region and is a component strategy within the framework of the Mallee Regional Catchment Strategy (2013-2019). The Mallee Waterway Strategy and supporting assets database provides a framework for all current and future works on waterways in the region and provides long term targets for the restoration of the region's waterways. Lower Murray Water is a partner in the delivery of the works program.

4 Demand Forecasts

4.1 Supply System Summary Details

Current population and connection estimates are summarised in **Table 3**. Residential connections equate to about 88% of the total connections across the systems.

Table 3 Summary of Current Population and Connections

Supply System	Towns Supplied	Population[2]	Connections[1]		
			Residential	Non-Residential	Total
Mildura System	Mildura, Irymple & Merbein	43,900	18,560	2,169	20,729
Red Cliffs	Red Cliffs	3,600	1,521	171	1,692
Robinvale	Robinvale	2,100	791	192	983
Kerang	Kerang	3,900	1,799	335	2,134
Piangil	Piangil	250	100	16	116
Koondrook	Koondrook	950	436	58	494
Murrabit	Murrabit	100	43	12	55
Swan Hill	Swan Hill, Nyah/Nyah West, Lake Boga and Woorinen	13,800	6,041	1,012	7,026
Total System		**68,600**	**29,264**	**3,965**	**33,229**

Notes 1: As stated in 2015/16 Annual Report

2: Based on 2015/16 residential connections and Victoria in Future 2016 Average Household Size

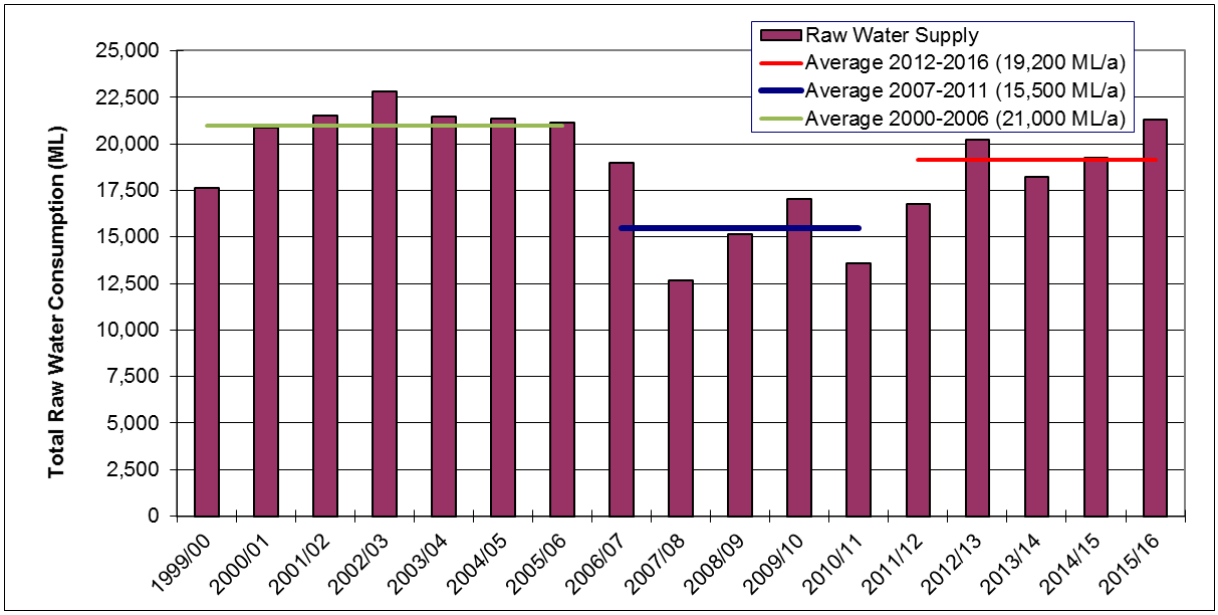
4.2 Historical Water Use

Total Raw Water Consumption

The average annual unrestricted raw water use between 1999/00 and 2005/06 was about 21,000 ML across all supply systems (refer **Figure 5**). Raw water consumption over those seven years was influenced by annual climatic variability and moderate growth in population. Water restrictions were not applied over the period and there were no significant regulatory changes. The five year period from 2006/07 to 2010/11 saw a large reduction in annual water consumption to 15,500 ML, due largely to the imposition of water restrictions from 2006/07 to 2009/10, and cooler, wetter conditions in 2010/11.

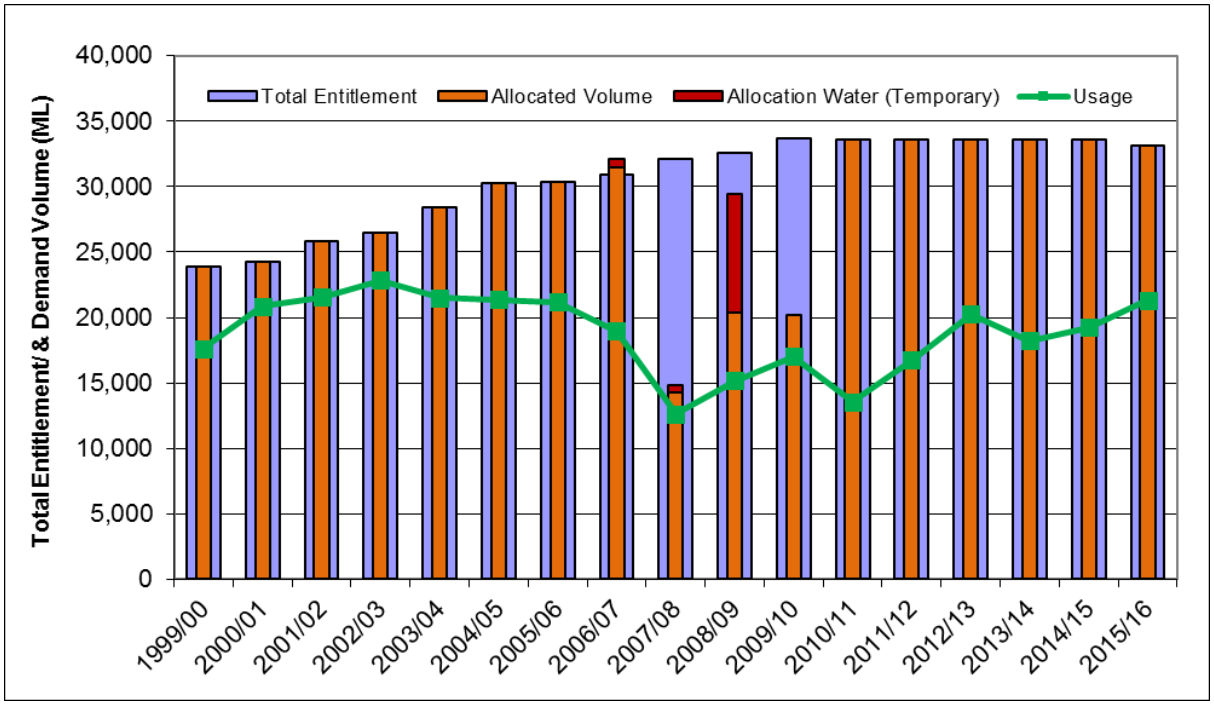
The most recent five year period from 2011/12 to 2015/16 has seen an increase in annual water consumption to around 19,200 ML, remaining below the average consumption for the pre-2006 period, noting that the water use in this latest period has also been unrestricted.

Figure 5 Total Annual Raw Water Consumption for the Region



Lower Murray Water aims to maintain entitlements at 50% above the rolling three year average total raw water demand, supplemented by the application of water restrictions and purchasing water allocation to overcome potential shortfalls during low allocation years. **Figure 6** provides a comparison of allocated volumes, including allocation trades, and water consumption in recent years.

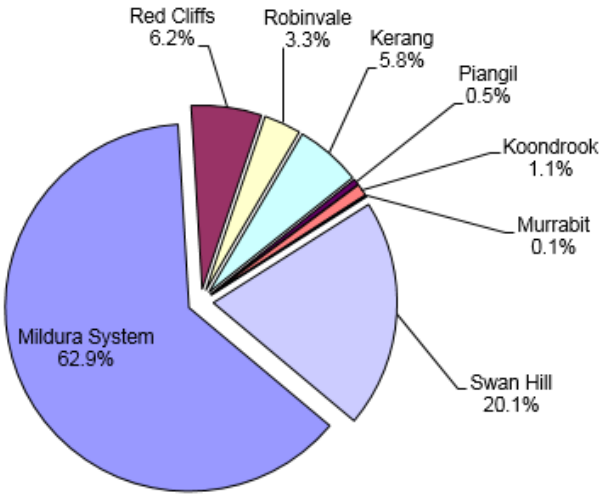
Figure 6 Comparison of Water Consumption and Allocated Water



Water Use Across the Systems

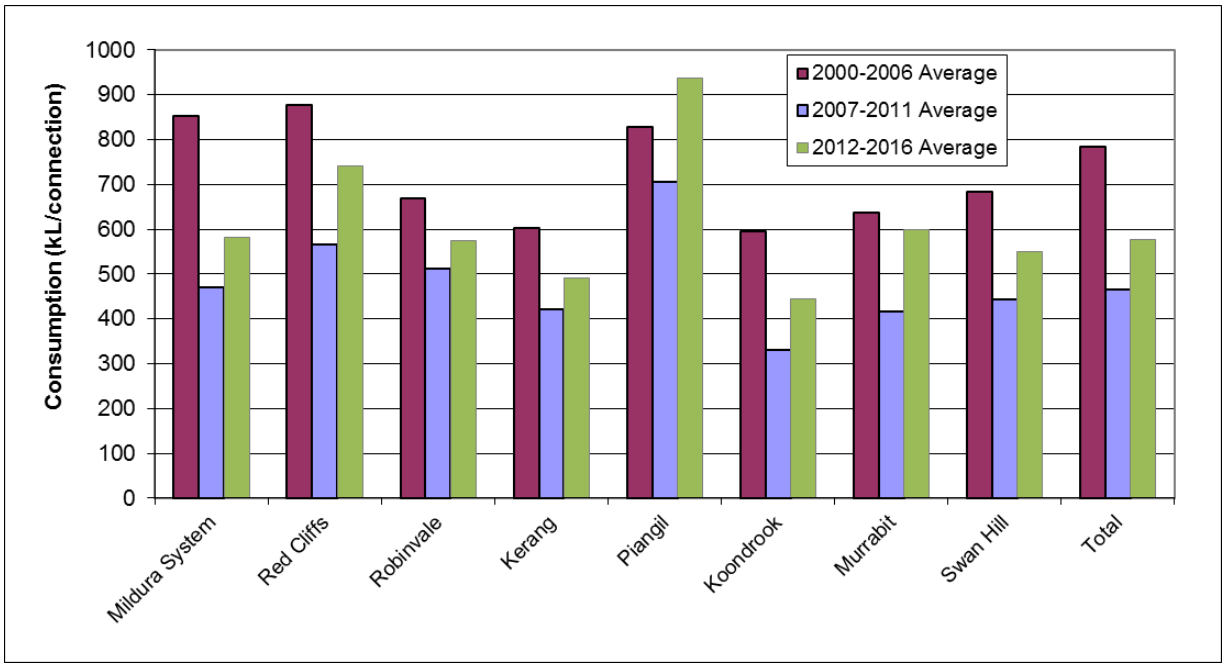
Water consumption across Lower Murray Water's region generally occurs in proportion to population as is illustrated in Figure 7, with almost 90% of the total annual water consumption occurring in the three major centres of Mildura, Kerang and Swan Hill.

Figure 7 Water Consumption Across the Region



Current annual total system consumption rates vary between 550 to 580 kL/connection in larger systems such as Mildura and Swan Hill, to a maximum of about 940 kL/connection in the Piangal system. Per connection consumption in towns such as Piangil and Red Cliffs are affected by the relatively large proportion of non-residential use. The average annual total water consumption across the entire system is about 580 kL/connection. **Figure 8** illustrates consumption rates across the systems.

Figure 8 Total Water Consumption Rates throughout the Region

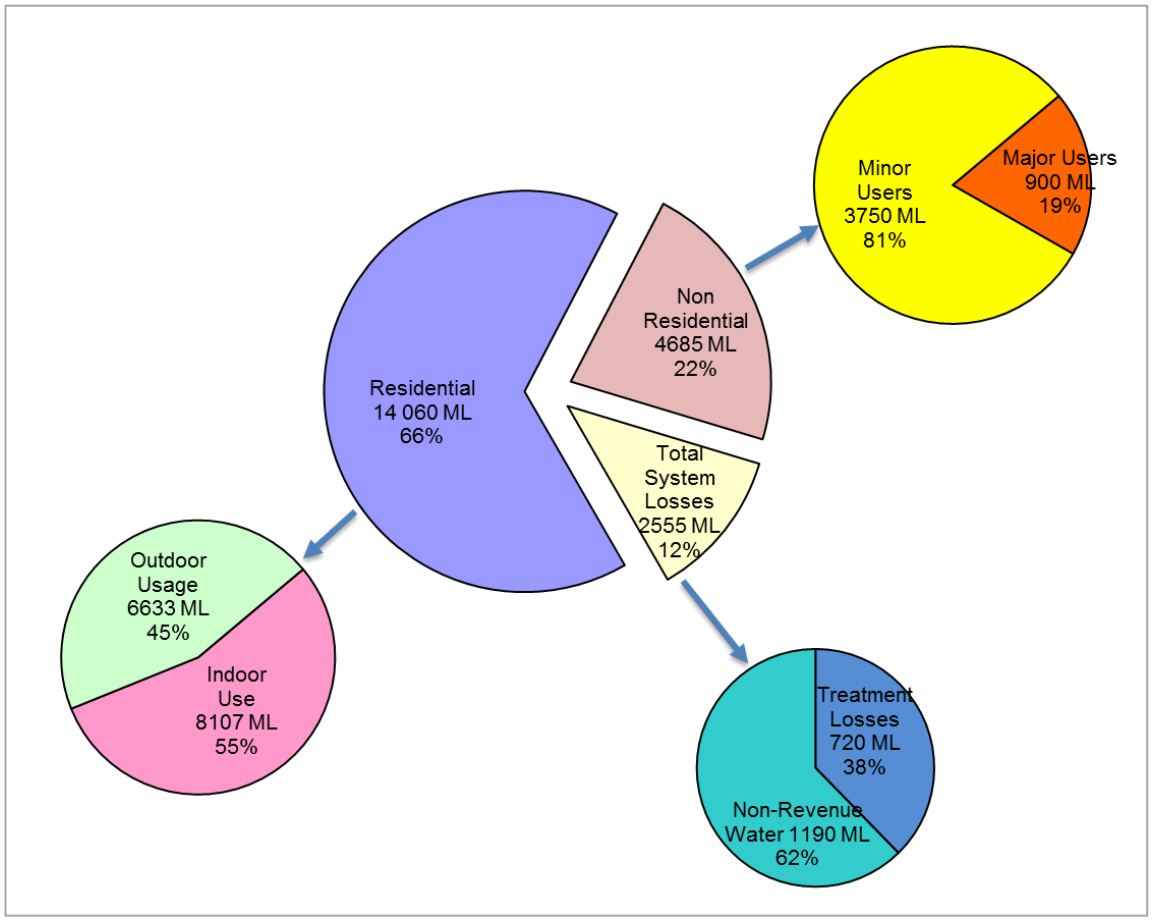


Distribution of Water Users by Sector

Lower Murray Water supplies about 33,200 connections with water. The connections cover both residential and commercial/industrial customers.

Figure 9 illustrates the distribution of water consumption across uses for the average annual demand of 21,300 ML.

Figure 9 Distribution of Water Use



Residential Water Use

It is difficult to determine how much water is used within homes, used outside on gardens etc. An analysis of quarterly water use in the water supply systems of Lower Murray Water indicates that in-house use varies from about 40% to 60% of total residential consumption, with weighted average in-house use about 55% of total residential usage. Outdoor use therefore accounts for 45% of total residential usage.

Non Residential Water Use

Usage in this category includes major use on recreation and garden areas by Councils. Other major users also include wineries and food processors. Water consumption by major users totalled nearly 900 ML in 2015/16.

Non Revenue Water and Losses

Lower Murray Water's water treatment plants are mainly conventional, which produce losses in the order of 2.5% to 5.0% (2013/14 to 2015/16). Non revenue water, which is measured by the difference between water delivered from the treatment plants and metered consumption, varied from 2.9% to 6.7% from 2013/14 to 2015/16. Overall total system losses averaged around 12% of raw water taken from river and channel sources.

4.3 Urban Demand Forecasts

Demand Forecasting Approach

The key drivers for Lower Murray Water's urban water demand growth are population growth, changes in residential consumption per connection (primarily due to water efficiency measures and pricing impacts), and changes in industrial water demand. For the development of the 2017-2066 UWS, raw water demand for each of Lower Murray Water's systems was forecast based on estimates of each of the key demand components, including residential, non-residential and non-revenue water (including treatment plant losses).

For each of the systems, per connection consumption was calculated based on average reported residential and non-residential connections and consumption figures for the three-year period 2013/14 to 2015/16. The per connection consumption figures were then applied to residential and non-residential connections forecasts for each of the systems to determine the total metered demand forecast. Residential and non-residential connection forecasts for each of the systems were based on historical growth rates and/or Victoria in Future 2016 population and household projections.

Reported leakage losses (non-revenue component of water produced by treatment plants) for each of the systems were then added as a proportion of the total metered demand forecast to determine the total potable water produced forecasts. Leakage losses were based on reported losses for the three-year period 2013/14 to 2015/16.

Reported treatment plant losses for each of the systems were then added as a proportion of the total potable water produced forecast to determine the total raw water forecasts. Treatment plant losses were based on the reported losses for the two-year period 2014/15 to 2015/16. Key assumptions used in the derivation of the raw water forecasts for each of Lower Murray Water's system are summarised in **Table 4**.

Table 4 Key Demand Forecasting Assumptions

System	Current average annual residential consumption (kL/connect)	Annual residential connection growth rate (%)	Current average annual non-residential consumption (ML)	Annual non-residential connection growth rate (%)	Av. Ann. Leakage Losses (% total consump.)	Av. Ann. Treatment Plant Losses (% water produced)
Mildura	497	1.32%	2509	1.01%	4.0%	2.7%
Red Cliffs	437	1.53%	526	0.60%	8.0%	2.7%

System	Current average annual residential consumption (kL/connect)	Annual residential connection growth rate (%)	Current average annual non-residential consumption (ML)	Annual non-residential connection growth rate (%)	Av. Ann. Leakage Losses (% total consump.)	Av. Ann. Treatment Plant Losses (% water produced)
Robinvale	474	0.59%	171	0.00%	6.6%	2.8%
Kerang	424	0.44%	172	0.60%	9.2%	2.7%
Piangil	475	0.82%	53	0.00%	12.9%	2.8%
Koondrook	384	0.90%	20	0.58%	11.6%	2.8%
Murrabit	430	0.79%	7	0.00%	19.9%	3.8%
Swan Hill	447	0.69%	932	0.20%	5.1%	2.7%

Uncertainty Associated with Demand Forecast

The major uncertainties associated with demand forecasting are typically uncertainty due to growth projections and uncertainty due to inter-annual demand change from climate variability. For the Lower Murray Water region, growth projections are generally stable or low, with historical connection growth providing a good indicator of future growth for most of the systems. The variation in raw water consumption demonstrates that climate variability does have a large influence on demand, with cooler, wetter years such as 2010/11 having lower demand and hotter, drier years such as 2005/06 having higher demand.

Another uncertainty associated with some of Lower Murray Water's systems is use by major industries and other commercial customers. These customers were consulted (for the Water Plan) on expected water demand increases, with no significant increases identified over the short to medium term. Consultation with the Mildura Rural City Council revealed no significant new water using industries or industrial developments in the region in the short term.

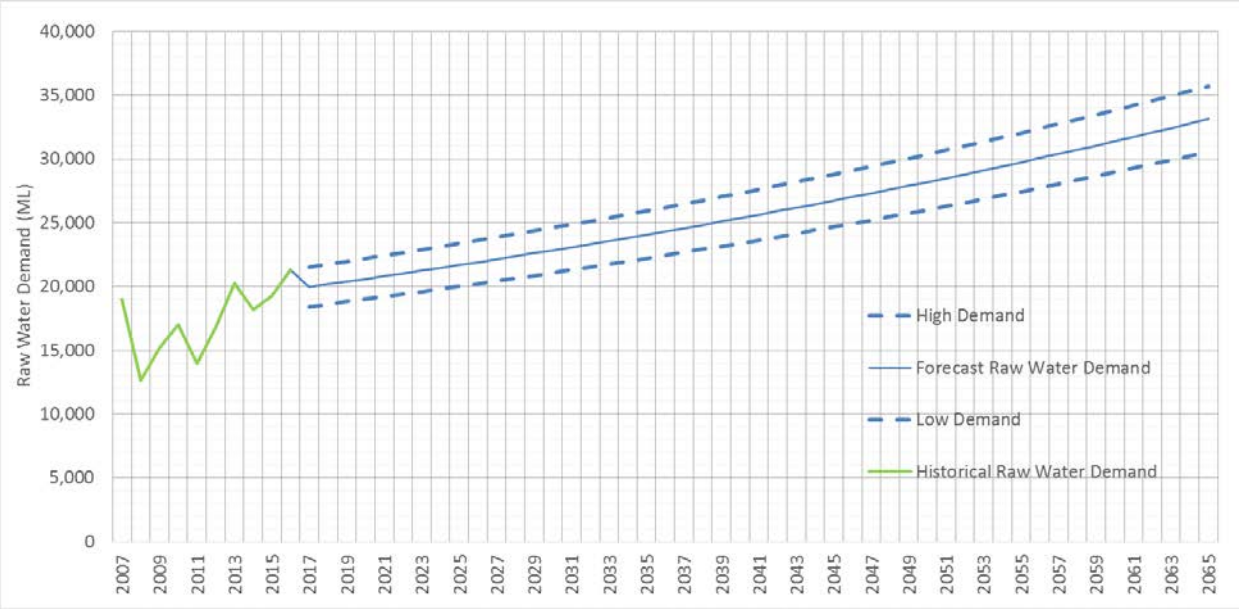
To represent uncertainty associated with the baseline demand forecast, upper and lower bound demand forecasts were derived, illustrating the potential range in future demand. The upper and lower demand bounds largely represent the uncertainty associated with inter-annual consumption variability, and are based on the minimum annual demand over the three year period 2013/14 to 2015/16, and the maximum annual demand over the same period.

Total Raw Water Demand Forecasts

Based on the derivation method described above, **Figure 10** below shows the combined raw water demand forecast for the Lower Murray Water systems for the 50-year forecast period 2017 to 2066. The current average annual demand adopted for the UWS is 19,600 ML. The forecasts show that if residential water consumption per household remains at current levels, annual raw water demand could increase from 19,600 ML in 2016 to 21,900 ML by 2026, 25,100 ML by 2040 and 33,100 ML by 2065. Demand is also likely to be influenced by the

increasingly drier climatic conditions from climate change. This may increase demand to the upper end of the forecast range.

Figure 10 Urban Water Demand Forecasts



5 Supply Forecasts

5.1 Current Estimated Yield

The yield of a water supply system is defined as the average annual volume that can be supplied at a specified reliability, subject to operating rules and typical demand patterns. For water resources planning purposes, both supply and demand are expressed as average volumes. Entitlements held by Lower Murray Water define the maximum annual volume of water which can be diverted from the relevant sources. Therefore, it is important to note that the entitlement volume is not always equivalent to the system yield.

For Lower Murray Water systems, the yield is estimated to be the allocated volume in June that occurs in 96% of years (1 in 25 years) based on the current volume of entitlement held, and represented as an average volume. For the purposes of this UWS, it was assumed that the yield is 87% of the maximum annual volume defined by the allocation.

Based on the current entitlement volume of 32,431 ML and modelled allocations for the Murray system, the yield of Lower Murray Water's system under long term streamflow

conditions has been estimated to be 28,200 ML. System yield estimates are summarised in **Table 5**.

Table 5 Estimated Reliability, Allocations, Entitlements and System Yield

Annual Reliability	Allocation (%)	Allocated Volume (ML)	Yield (ML)
1 in 100 (99%)	61	19,640	17,080
1 in 50 (98%)	84	27,242	23,690
1 in 25 (96%)	100	32,431	28,200
1 in 20 (95%)	100	32,431	28,200

5.2 Supply Forecasts

The adopted supply forecasts have been developed within a framework consistent with DELWP's UWS Guidelines. The framework adopts the following principles:

- Establish a baseline supply forecast which represents the most plausible outcome, notwithstanding the uncertainty in various inputs used to derive the yield estimate;
- Use sensitivity analysis to develop an envelope of potential supply forecast outcomes that represents uncertainty; and
- Undertake planning by adopting a baseline supply forecast, and identifying contingencies in the UWS to cater for the range of potential outcomes.

Climate Change Impacts

Aside from operational issues, including water quality events, the major uncertainty associated with the region's water supply is climate change and variability. The impact of climate change on system yield has been assessed using updated results from simulation modelling of the Murray system.

The climate change scenarios adopted for the system yield assessment were developed in accordance with DELWP's Climate Change Guidelines, and are based on the current climate baseline yield. Based on these scenarios, the supply forecasts which have been adopted for planning purposes comprise:

- **High Yield Forecast** – based on the low climate change scenario,

- **Baseline Yield Forecast** – based on the medium climate change scenario,
- **Low Yield Forecast** – based on the high climate change scenario .

Adopted Supply Forecasts

The adopted supply forecasts for each of the climate scenarios are presented in **Figure 11** and summarised in **Table 6**.

Figure 11 Urban Water Supply Forecasts

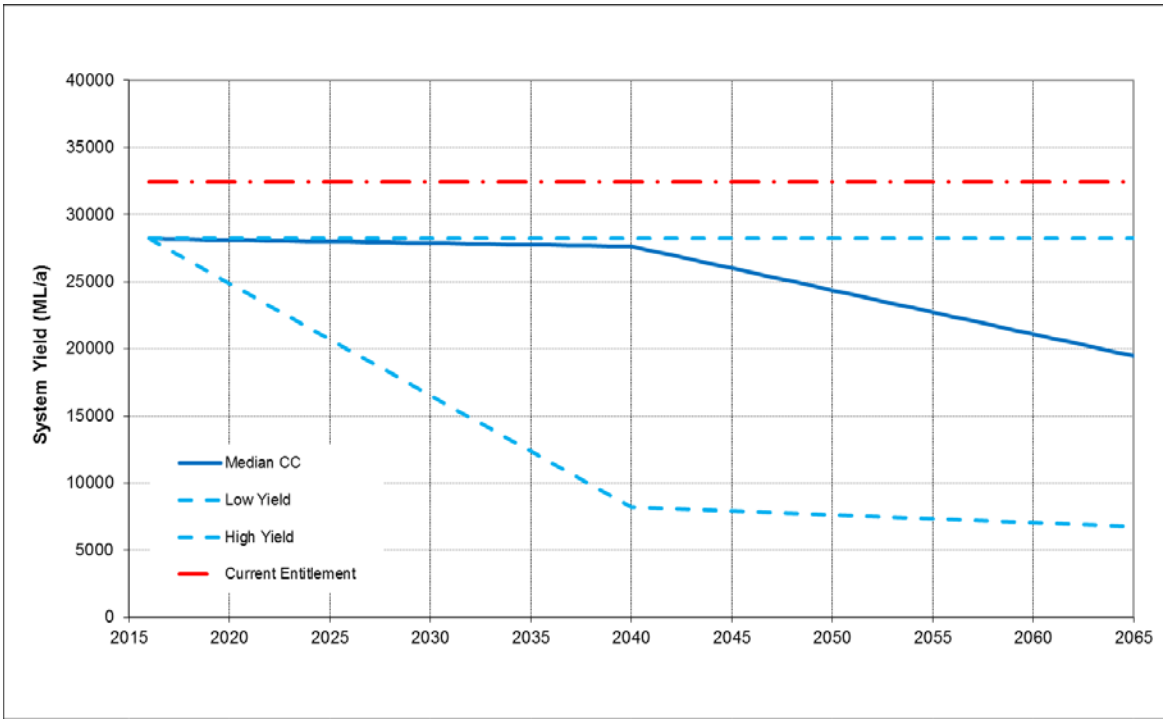


Table 6 Estimated System Yields for Planning Scenario

Adopted Scenario	Estimated System Yield (ML/a)		
	2017 (current climate)	2040	2065
High Yield (low climate change scenario)	28,200	28,200	28,200
Baseline Yield (medium climate change scenario)	28,200	27,640	19,460
Low Yield (high climate change scenario)	28,200	8,180	6,770

6 Current and Future Supply Demand Needs

A supply-demand balance for the Lower Murray Water region based on the adopted water demand and supply forecasts is presented in **Figure 12,** and summarised in **Table 7**.

Figure 12 indicates that the uncertainty surrounding the climate change impacts is far greater than the range of demand forecasts. For the baseline system yield, there will be no supply shortfalls until about 2044 for the baseline forecast demand, about 2041 for the higher demand, and 2048 for the lower demand.

Based on the baseline demand forecast, the supply shortfall in 2065 is around 13,700 ML for the medium climate change scenario. The minimum supply shortfall in 2065 is around 2,400 ML while the maximum shortfall is around 28,900 ML.

Figure 12 Baseline Supply-Demand Balance for the Total System

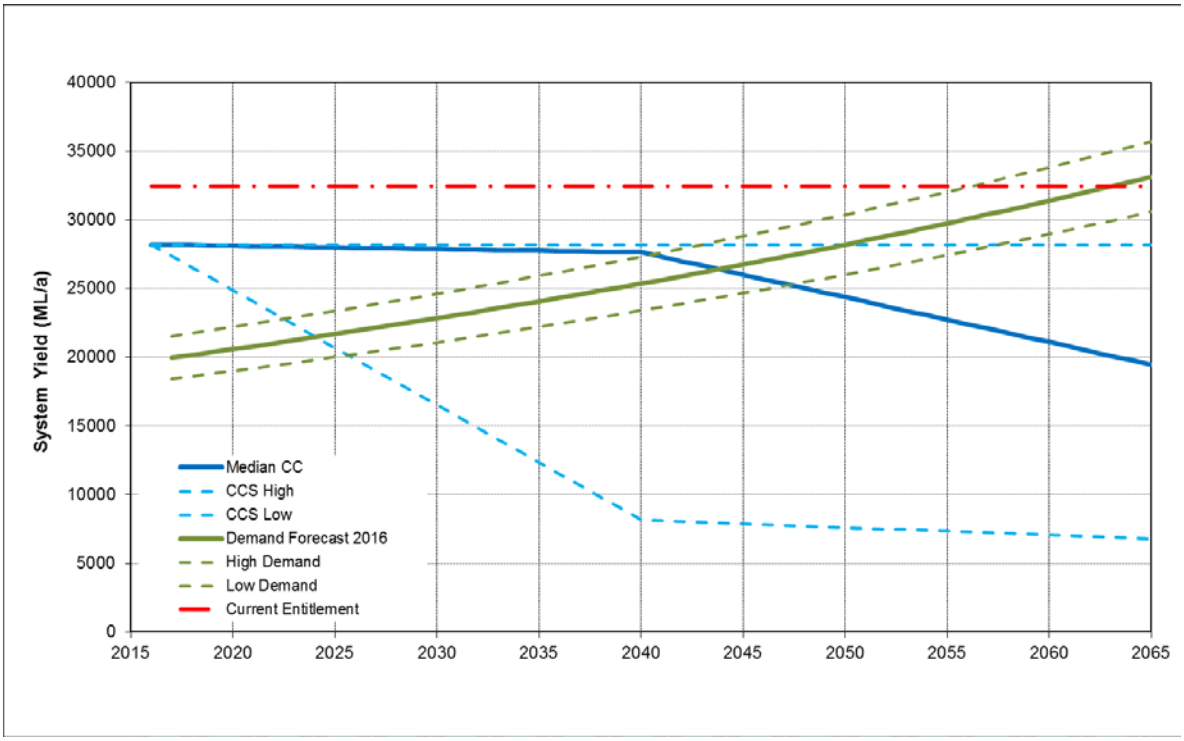


Table 7 Supply-Demand Balance for Lower Murray Water's Supply System

Supply-Demand Balance	Shortfall[1]		
	2016	2040	2065
Maximum Shortfall	5,850	-19,140	-28,920
Baseline Shortfall	8,210	2,280	-13,670
Minimum Shortfall	9,770	4,800	-2,370

Note: (1) negative value indicates supply shortfall

7 Options for Securing the Region's Water Supply

7.1 Introduction

This Strategy has identified that the major uncertainty in Lower Murray Water's supply system relates to the impacts on allocations resulting from climate change. The supply-demand balance highlights a wide range in future outcomes relating to supply. These outcomes significantly influence decisions to address the volume and timing of potential shortfalls.

Lower Murray Water's preferred action for securing the region's water supply will focus on the purchasing of additional water shares and allocation from the water markets. This provides greater flexibility and a more cost-effective approach to balance future supply and demand. On this basis, the major issue to be addressed by Lower Murray Water is the timing and volume of water purchases and how this affects customer pricing.

It is noted that Lower Murray Water's supply systems are generally located on the River Murray, and as such options to interconnect towns (extending the water grid) are unnecessary.

7.2 Purchasing Additional Water Entitlements

Lower Murray Water reviews the rate of new connections on an annual basis and purchases sufficient entitlement (water shares) to service such connections on a retrospective basis. To protect the reliability of supply for its customers, Lower Murray Water aims to maintain entitlements at 50% above the rolling three year average total raw water demand. This provides contingency for additional unexpected growth and unforeseen impacts of drought and climate change.

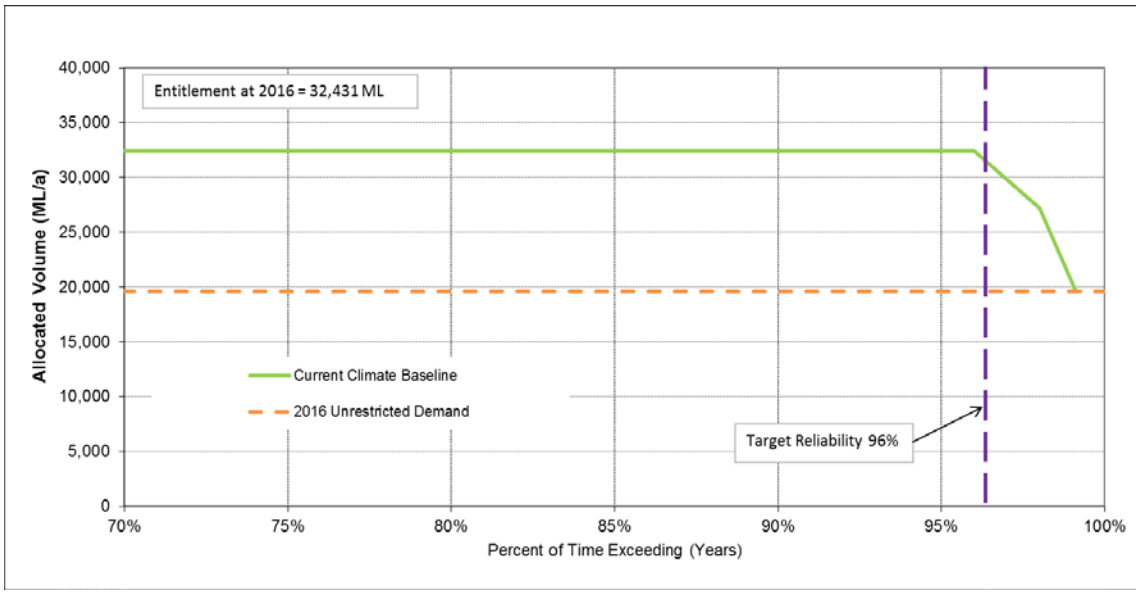
Figure 13 shows the reliability profiles for allocated water at 2016 and 2040, based on end of season allocations. The 2040 chart is based on an entitlement of 36,000 ML in accordance with the above entitlement purchasing policy.

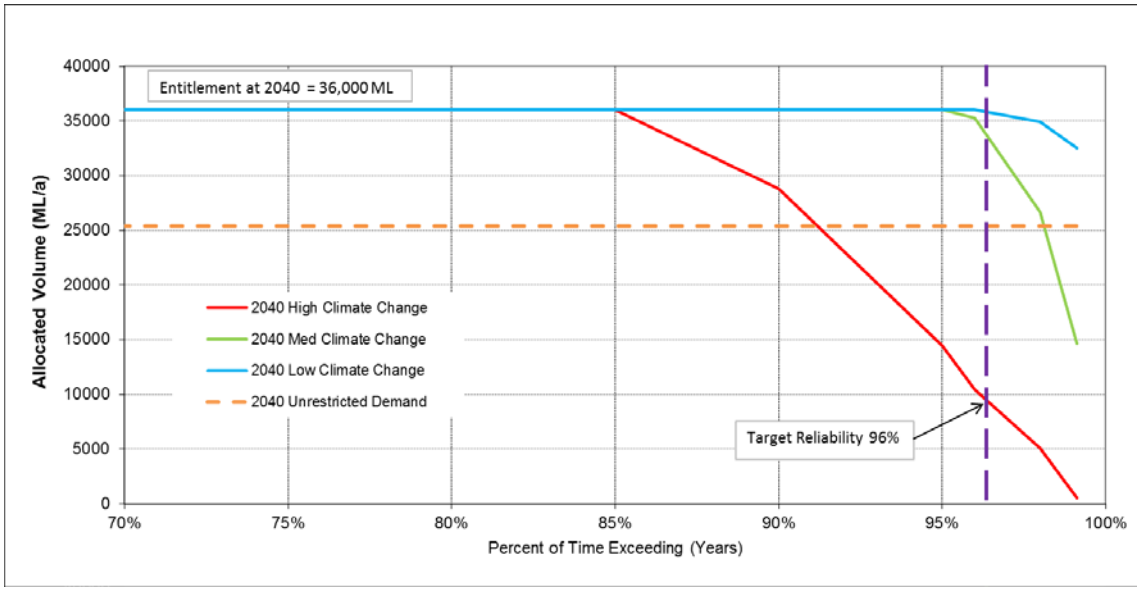
- The 2016 chart shows that the water allocated may fall below current demand levels in about 1 year in 100, potentially requiring the purchase of water allocation in these years.
- The 2040 chart shows that the risk of requiring water restrictions at 2040 is slightly higher under the medium climate change scenario, allowing for current entitlements to be held at 50% above the three year average demand. Under the high climate change scenario however, additional entitlement would be required to maintain the target reliability of 96%.

Programs to reduce demand will minimise the need for additional entitlements. However, it is recognised that programs to reduce demand are limited, and additional water supplies will be needed throughout the timeframe of this Strategy.

The policy of maintaining the entitlement at about 50% above the running three year average raw water demand will be maintained into the future, as well as utilising carryover as a means to defer future investment.

Figure 13 Reliability of Allocated Water at 2016 and 2040





7.3 Complementary Management Actions

Lower Murray Water will continue to invest in other complementary programs which offset the impacts of potential future shortfalls. These complementary works include:

- Reducing the demand for potable water;
- Alternative options to increase the supply of potable water; and
- Either increase the supply of water, or reduce the demand for water, by alternative water sources.

For this UWS, the range of complementary options have been identified and assessed at a preliminary level, building on assessments carried out for the 2006 and 2012 Water Supply Demand Strategies.

Reducing Demand for Potable Water

There are a range of potential actions that could be undertaken across each of Lower Murray Water's supply systems that could reduce current and future consumption levels, summarised in **Table 8**.

Table 8 Preferred Options for Reducing the Demand for Water

Options	Actions	Potential Savings
Saving Water in the Home		
Maintain water efficiency education and awareness campaign	Implement the Victorian Government's '*Target Your Water Use*' program Implement *School Water Efficiency Program* (SWEP) Renew advertising campaign Continue to support *Smart Water Advice* program Increased marketing via dedicated website, promotional material, community awards Promote water efficient appliances	700 ML/a by 2040 1,400 ML/a by 2065
Implementation of efficient garden program	Extend waterwise garden demonstration sites to other regions Work with suppliers to promote efficient garden irrigation systems	
Saving Water in Commercial & Industrial Businesses		
Assist Councils to implement Local Sustainable Water Strategies	Provide relevant data on water usage in the non residential sector Work with Councils on specific projects, particularly with regard to reducing use of potable water on recreational and garden facilities (i.e. recycling / reuse options)	500 ML/a by 2040 600 ML/a by 2065
Work with top 20 major water users to reduce consumption	Provide grants for water audits	
Increase water efficiency education and awareness to minor users	Renew advertising campaign Develop localised education initiatives & programs Increased marketing via dedicated website, promotional material, community awards	
Incentives and Rebates		
Regulatory support for water efficient appliances	Continue to deliver programs for incentives and rebates for purchasing water efficient appliances	NQ*
Policy and Regulation		
Pricing	Review and revise pricing structure in line with government policy	NQ*

*Note: NQ denotes "not quantified"

Improving the Use of Existing Supplies

While Lower Murray Water has made some substantial improvements in recent years to make more efficient use of existing supplies, a range of options have been identified and assessed to further improve the use of existing supplies, summarised in **Table 9**.

Table 9 Preferred Options for Improving the Use of Existing Supplies

Options	Actions	Potential Saving
Savings in non-revenue water		
Leakage detection program	Network leakage assessments Improved metering program	300 ML/a by 2040 400 ML/a by 2065
Reduce operational losses at treatment plants	Undertake water audits at all treatment plants to identify major losses	
Managing water security		
Continue to monitor the impact of carryover rules	Continue monitoring and review program to assess impacts of carryover on system reliability	Not quantified

Alternative Water Sources

Addressing Action 5.1 of *Water for Victoria*, Lower Murray Water will work with local government and other public open space managers to identify water sources to maintain priority open spaces such as sporting facilities, public gardens and street trees during drought to enhance community health, wellbeing and liveability. Identified open spaces and water sources will be incorporated into future Drought Preparedness Plans.

Lower Murray Water has prepared alternative water maps for Mildura and Swan Hill. These maps, presented in **Figure 14** and **Figure 15**, illustrate the current utilisation of alternative water sources such as recycled water and roofwater harvesting in these towns. The maps provide a valuable tool to assess future alternative water opportunities, with preferred options summarised in **Table 10**.

Addressing Action 5.7 of *Water for Victoria*, Lower Murray Water will work with other stakeholders through integrated water management forums to identify and prioritise places that would most benefit from a place-based plan, with agreed outcomes incorporated in future Urban Water Strategies.

Table 10 Preferred Options for Alternative Water Sources

Options	Actions	Potential Saving
Recycling		
Continue to support uptake of recycled water by industry and Municipalities	Assess recycled water opportunities within Councils, golf courses and caravan parks	250 ML/a
Continue to support uptake of recycled water for agriculture	Assess opportunities for recycled water use by agriculture from Koorlong WWTP	Not quantified
Stormwater		
Roofwater harvesting opportunities	Assess roofwater harvesting opportunities in new developments	Not quantified

Figure 14 Alternative Water Map for Mildura

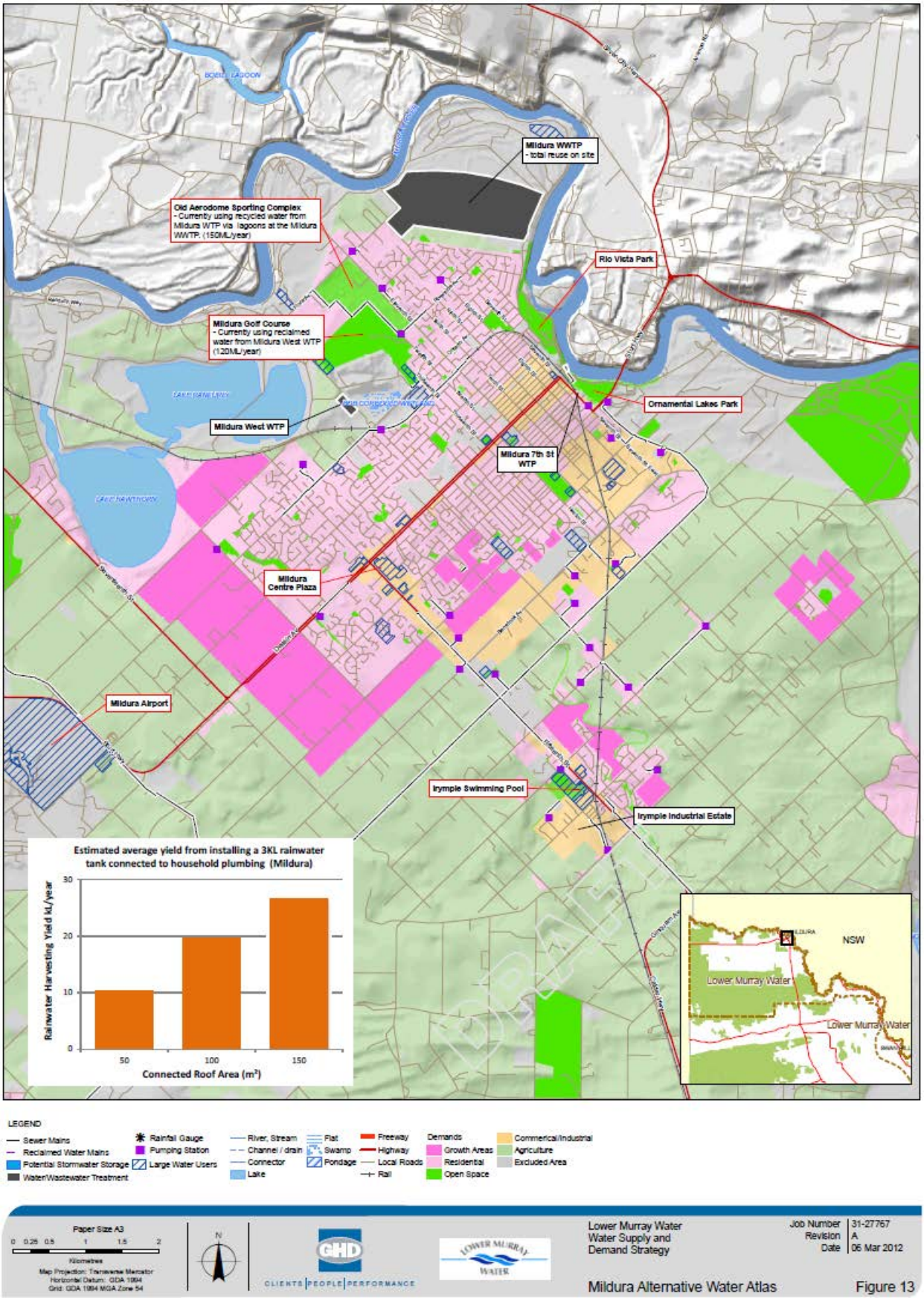
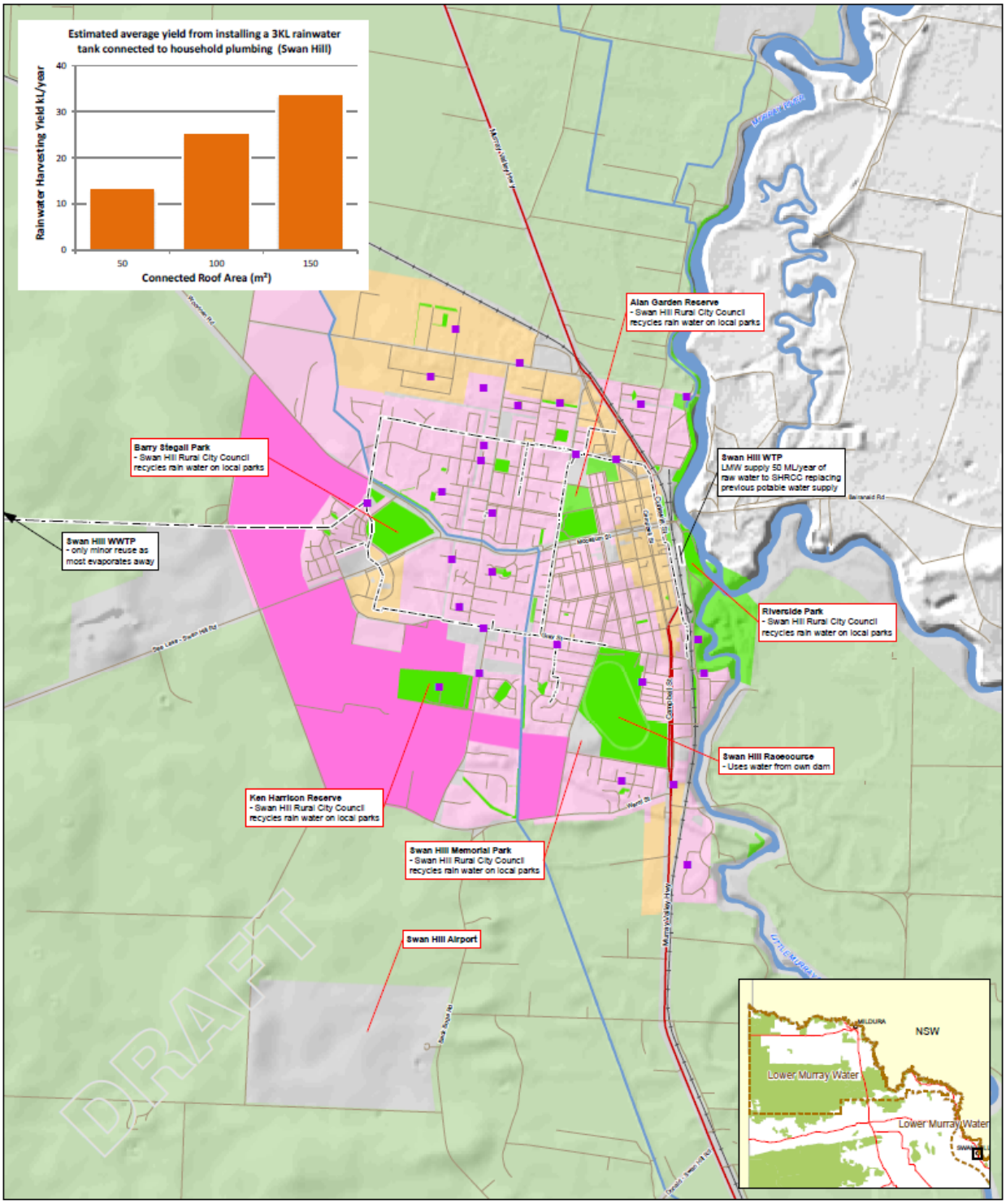


Figure 15 Alternative Water Map for Swan Hill



8 Proposed Action Plan for Securing Future Water Supply

Managing the impacts of reduced water allocations resulting from climate change is the main issue facing Lower Murray Water, now and into the future. A range of initiatives has been implemented in recent years, such as carryover arrangements for unused allocations, which will assist to mitigate the impacts in the short term.

Lower Murray Water's preferred action for securing the region's water supply will focus on the purchasing of additional allocation and water shares from the water markets. This action provides flexibility in terms of the timing of decisions to purchase water, and a more cost-effective approach compared to large capital investments in new infrastructure. Based on customer input, Lower Murray Water has committed to purchasing 360 ML of additional entitlement per annum, commencing in 2017/18. The timing and volume of water purchases is illustrated in **Figure 16**, noting that the impacts of climate change may bring forward the purchase of water shares or increase the volume required.

Lower Murray Water will continue to use management tools such as carryover to make more efficient use of the available water supply.

In addition, a range of complementary actions which will offset the impacts of potential future shortfalls has been identified as part of this strategy.

The action plan presented in **Table 11** and **Table 12**, summarises the key actions which will be pursued by Lower Murray Water to balance supply and demand over the 50-year period 2017 to 2066. This action plan informs some of the key works during the next Water Plan period (2018/19-2022/23).

Figure 16 Proposed Purchasing of Water Shares

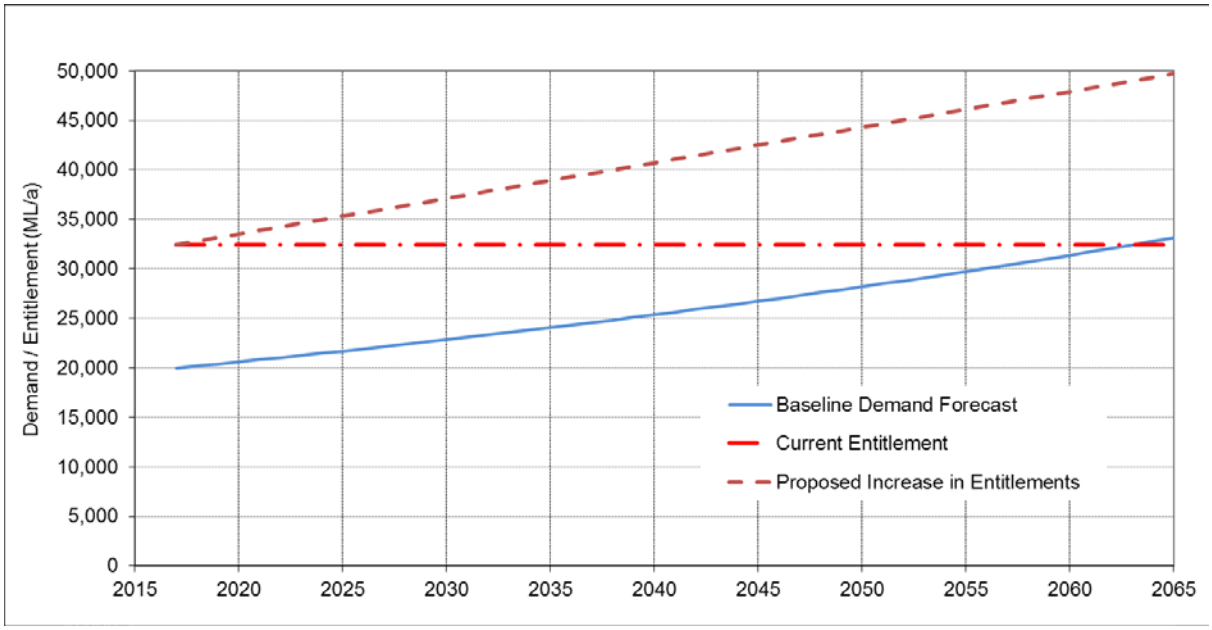


Table 11 Preferred Action for Securing Water Supply

Action	Timing of implementation and volume of water provided (ML/year)			
Purchasing Additional Water Entitlement	2017	2030	2040	2066
To maintain a 50% buffer between annual usage and the amount of entitlement held, Lower Murray Water will purchase 360 ML of entitlement per annum.	360	360	360	360

Table 12 Complementary Actions Securing Water Supply

Action	Benefits
Reducing Demand for Potable Water	
Lower Murray Water will continue to maintain a focus on water efficiency and awareness by supporting a range of efficiency measures across its supply systems to reduce per capita consumption	Will minimise increases in climate sensitive demand under climate change conditions
Improve use of existing supplies	
Lower Murray Water will improve metering and monitoring of its supply system to ensure system losses are maintained at best practice standards	Reduced raw water diversions from River systems
Lower Murray Water will actively manage carryover to maximise system reliability during dry periods	Mitigate risk of requiring restrictions or need to purchase water allocation during dry periods
Alternative Water Sources	
Lower Murray Water will continue to work with the community to identify cost-effective opportunities for the utilisation of alternative water. Current use and opportunities will be communicated via the alternative water maps	Fit for purpose supplies, reducing potable water demand
Stakeholder Consultation	
Lower Murray Water will consult with Councils, Traditional Owners and other stakeholders in the implementation of this Urban Water Strategy	Ensures that stakeholder objectives and values are recognised
Lower Murray Water will work with other stakeholders through integrated water management forums to identify and prioritise places that would most benefit from a place-based plan, with agreed outcomes incorporated in future Urban Water Strategies	Identification of challenges and opportunities for achieving water-related benefits in priority areas
Lower Murray Water will work with local government to identify water sources to maintain priority open spaces such as sporting facilities, public gardens and street trees during drought. Identified open spaces and water sources will be incorporated into future DPPs	Enhance community health, wellbeing and liveability during drought

Monitoring and Reporting

Lower Murray Water will actively monitor the supply and demand balance as part of the implementation of this strategy. As part of the preparation of this strategy, Lower Murray Water has prepared an Annual Water Outlook, which will be updated on an annual basis and published by 1 December for communicating supply reliability and level of service to its customers and the State Government. The Annual Water Outlook will enable the areas of greatest uncertainty to be tracked against the water supply and demand balance presented in the strategy, with actions being brought forward or deferred, as required.

9 Community & Stakeholder Engagement

Lower Murray Water's Urban Water Strategy has been developed in consultation with the community, our customers and key stakeholders, and the LMW Board. Lower Murray Water's UWS Project Team together with the Customer and Stakeholder Team has actively participated in consultation and engagement with key stakeholders and the community to help shape and influence LMW's UWS.

Lower Murray Water's Board has participated in several Strategic-planning sessions to assist in providing direction for the UWS and Pricing Submission 4.

As part of the ongoing commitment to engagement and consultation with customers and stakeholders Lower Murray Water will continue to engage with the community on several areas identified in the UWS and the Pricing Submission. This approach is consistent with our Customer Experience Strategy processes.

The Consultation and Engagement Plan is included as Appendix C of the strategy document.

9.1 Community Engagement

Lower Murray Water undertook community engagement and consultation in several forms including:

- Focus Groups consisting of various representations of the community
- Pop up kiosks and various locations
- Surveys
- Social media
- Presentations to the community

Lower Murray Water's focus groups consisted of various cross sections of the customer base including commercial, residential, schools, irrigators and CALD groups.

During these consultations, a consistent approach was applied and key questions were asked across all audiences to explore key themes relevant to the UWS and Pricing Submission:

- Blackwater mitigation and subsequent Water Treatment Plant upgrades required
- Maintaining the current bulk entitlement buffer to ensure less severe restrictions during sustained dry periods and low allocation
- Education and conservation programs
- Guaranteed service levels for customers
- Social benefits and the importance of green spaces
- Climate change

Key focus groups were established to ensure a good representation of customer and key stakeholder views could be shown.

The following scenarios were tested and discussed during the sessions for the UWS:

1. Undertake channel removal – social / safety benefit for schools and community
2. Purchasing more generators for back up
3. Pay more for blackwater mitigation
4. Expansion of the urban water network
5. Purchase additional water entitlement to reduce the risk of severe restrictions during low allocation periods

Table 13 Community Engagement Summary

Engagement Activity	Number engaged
Pop up kiosks at various locations including: - Farmers markets - Local shopping centres	250+ participants
Survey – online and via telephone	300 telephone 121 Urban online 112 Rural online
Community Focus groups	70 participants
Land and Development sector forums	10 participants
LMW Customer Committee forums	74 participants

Table 14 Key Options Discussed

Category	Demand Management	Loss Reduction	Securing Water Supply Systems	Supply Augmentation
Options considered	Restriction of supply – PWSR Staged Restrictions Education and Awareness Programs Incentives and giveaways for water conservation practices – showerheads, trigger nozzles Pricing Target Your Water Use	Reduced raw water diversions from River Systems Network leakage assessments Improved metering program Water Audits of all treatment plants	Urban Water Trading and purchase Carryover Regulated supply permanent and seasonal trading	Potable substitution (with stormwater, reclaimed water, or otherwise) Recycled water generated from Water Treatment plants Rainwater harvesting

9.2 Outcomes

Lower Murray Water has a statistically valid representative of its customer base with consultation undertaken with a broad cross section of customers covering the geographical area within Lower Murray Water's service region. More than 1,000 customers have actively participated and provided valuable input into the development of the Urban Water Strategy and the Pricing Submission. Key areas of discussion have been customer service, innovation by both Lower Murray Water and how to support customers to be innovative, corporate social responsibility, guaranteed service levels, climate change and environmental issues.

Key themes from discussions and consultation forums can be summarised in the following topics:

- Consistent service as currently supplied (status quo)
- Continue to maintain low levels of restrictions – maintain Bulk Entitlement buffer to ensure less severe restrictions during years of low allocation
- Social responsibility to ensure community green spaces are maintained
- Keep customers informed of supply interruptions via more digital means – move to more online and digital customer interactions while still maintaining traditional methods

- Assist and support customers in hardship with early intervention – providing arrangements and plans or rebates off water bills (not cash back to the customer)
- Continue to invest in community education on water efficiency and encourage commercial users to implement water efficiency methods to adapt to climate change

Customer Values

1. Employing local staff and local contractors where possible
2. Having a real person answer customers calls
3. Reducing its greenhouse gas emissions in relation to customers' water supply and sewerage services
4. Being able to access real-time information about the property online or via a smartphone
5. Being able to make all account payments online or via a smart phone
6. Maintaining current service levels including local customer contact centre, water supply reliability, water quality issues, keep customers informed of planned and unplanned supply interruptions.

Customers felt the continued service level for reliable delivering of water, which was of good quality, was of most importance. Customers also felt that maintaining current arrangements (i.e. PWS Rules during time of drought or sustained dry periods) was of most importance rather than moving to more severe levels of restrictions. Research also showed that customers would be willing to pay a small additional charge annually to ensure this would occur. Customers felt that Lower Murray Water has a social responsibility to ensure green space and important recreational areas are maintained during low allocation periods. In addition, that education for the community was important to ensure water efficiency and conservation was entrenched within the region.

Climate Change

Customers support positive action relating to climate change and innovation within the business to ensure operations can remain sustainable into the future. Renewable energy was also suggested during the consultation process with options to be looked at including solar, and harvesting reclaimed water.

The community expressed the importance of being able to maintain community spaces and recreational areas as part of the social structure.

Aboriginal Engagement

Aboriginal engagement is ongoing within Lower Murray Water as part of the Urban Water Strategy and Pricing Submission consultation process. The Indigenous Engagement Plan is included as Appendix D of the strategy document.

Aboriginal engagement and consultation to date includes:

- Development of Indigenous Engagement Plan
- Discussions with Traditional Owners to identify important values in water resource management
- Development of Welcome to Country for LMW
- Cultural Awareness sessions for staff and executive
- Opportunities for employment and training programs for indigenous community members
- Development of a partnership plan

9.3 Endorsement of the Urban Water Strategy

The final Urban Water Strategy will be issued to the Honourable Lisa Neville MP, Minister for Water, for noting in April 2017.

Lower Murray Water would like to acknowledge the Delivery group, Stakeholder and Customer group, Customer Service Advisory Groups and the community for their contribution throughout the development of the strategy.

10 Glossary

Bulk Water Entitlement

A legal right under the *Water Act (1989)* to harvest and use water

Demand

The expected average annual future water demand

Desalination

The process of removing salt from seawater or brackish water so that it becomes suitable for drinking or other uses

Ecosystem

A dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment interacting as an ecological unit

Greywater

Wastewater from the laundry and bathroom

Groundwater

All subsurface water

Recycled water

Water derived from sewerage systems or industry processes that is treated to a standard appropriate for its intended use

Reliable supply

The supply available in storages despite seasonal variations to streamflow

Runoff

Precipitation or rainfall which flows from a catchment area into streams, lakes, rivers or reservoirs

Sewage

The waterborne waste from a community

Sewage system

The pipes and plant for the collection, removal and treatment of sewage

Streamflow

The flow in a stream or river

Stormwater

Rainfall runoff from urban areas

Triple bottom line

Integrated approach to the achievement of environmental, social and economic outcomes

Water utility

An organisation charged with supplying water to towns and cities for urban, industrial or commercial use

WWTP

Waste water treatment plant to treat sewage from urban and industrial areas.

System yield

The quantity of water that a storage or aquifer produces

Drought Preparedness Plan

March 2017

Document control sheet

Version history

Version no.	Date	Changed by	Nature of amendment

Contents

11 Introduction

11.1 About this document

- This is the 2017 update of Lower Murray Water's *Drought Preparedness Plan* (that includes the *Drought Response Plan*). It is included as an appendix to Lower Murray Water's *Urban Water Strategy 2017-2066*, with duplicate information removed.

11.2 Background

- Lower Murray Water's Statement of Obligations imposes obligations in relation to the performance of its functions and exercise of its powers as described in the Water Industry Act 1994. In relation to drought response, Section 6-4 requires Lower Murray Water to develop and implement an effective Drought Response Plan for each water supply system and make its drought response plans available to the public. In addition, Lower Murray Water is required to review, and if necessary amend, its drought response plans as follows:

- (a) at intervals of no more than five years; and

- (b) within twelve months of either:

    - (i) the lifting of any period of restriction imposed under the Drought Response Plan; or

    - (ii) any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system.

- This Drought Preparedness Plan (DPP) has been developed in parallel to Lower Murray Water's *Urban Water Strategy 2017-2066*. It is intended to be used by Lower Murray Water to guide the organisation in making decisions about appropriate actions to manage potential water shortages.

- Planning for response to drought involves consideration of three phases of activity: general monitoring, drought and post-drought. This plan has been developed in the general monitoring phase, so that responses are carefully considered and evaluated outside of the "emergency" situation when time for decision making may be limited.

The previous Drought Response Plan was last updated in 2012. This 2017 update of the DPP has adopted similar objectives as the previous DRP, as well as any actions that are still relevant to the current Lower Murray Water system.

11.3 Drought Preparedness Plan Purpose and Objectives

- The purpose of a DPP is to detail management actions to meet critical human needs during the following events:

- An extreme dry period, or

- A water quality event of an intensity, magnitude and duration that is sufficient to render water acutely toxic or unusable for established local uses and values

There are essentially three types of objectives that need to be considered in the development of a DPP:

- **Strategic** - Addresses the overall objectives for water shortage and links to other strategic objectives;

- **Planning** - Specifically related to the planning process; and

- **Operational** - Translate the strategic objectives into specific operational objectives.

The following set of objectives have been developed for Lower Murray Water's DPP:

- **Strategic Objectives**

To ensure a systematic, timely and efficient response to water shortage and minimise the impact on customers by:

- Provide timely warning of any water shortages that might occur during future drought events and the preparedness to deal with such shortages when they occur; and
- Identifying long term planning issues that should be considered in developing a DPP.

- **Planning Objectives**

To ensure that in the short term:

- Consumers and representatives of other interested groups are involved in the development of the DPP;
- The plan identifies all necessary steps that need to be taken throughout a water shortage including clear triggers that instigate certain actions;
- The plan is subject to regular review as the systems develop and as more information becomes available; and
- The plan is reviewed throughout the course of a water shortage and adjusted where necessary, and that all actions taken be evaluated after the end of the water shortage;

To ensure that in the long term:

- The agreed level of service (including security of supply) satisfies the requirements of Lower Murray Water and its customers at an acceptable cost; and
- All feasible options for achieving a balance between supply and demand are considered and evaluated in terms of their impact on stakeholders.

- **Operational Objectives**

To ensure that in the short term:

- In all water shortages a minimum supply of at least 60 L/p/d is provided;
- The most efficient use is made of water resources during periods of water shortages;
- A reliable assessment of water shortage status is provided so that Lower Murray Water is aware of the severity of the water shortage;

To ensure that in the long term:

- Lower Murray Water keeps informed of changes to total levels and patterns of demand and of consumer expectations in relation to desirable levels of service, so that it can make an assessment of whether the systems will be able to perform satisfactorily during future water shortages; and
- Restrictions are implemented and reviewed to ensure that bulk water entitlements and/or seasonal allocations are not exceeded.

12 Past Drought Experience

- All of Lower Murray Water's water supply systems draw water from fully regulated stream and channel systems, which have a high security of supply. In the period from the installation of weirs and major storages until the Millennium Drought, the Murray and Loddon Rivers were not severely affected by droughts, and domestic/town water supplies have not had to be restricted. Before the current system of storages was constructed, the Murray and Loddon Rivers would cease flowing during severe drought conditions. The last time the Murray River ceased flowing at Swan Hill and Mildura was in 1914. The Loddon River would have ceased flowing at Kerang in more recent times if it did not have flow supplemented by water from the Murray River.

- The Millennium drought that occurred from about 1997 to 2009 resulted in Lower Murray Water having to impose water restrictions from 2007 to 2010.

- Water restrictions were not received very well by customers, especially when irrigators did not come under the same restrictions, particularly in regard to garden and lawn watering. The Board resolved to bring the former FMIT irrigators in under the restriction By-law. Imposing Stage 4 water restrictions was especially hard on the community, and Lower Murray Water applied overall exemptions in September and December of 2007 to ensure customers' gardens did not die. Most customers accepted that water restrictions were necessary, particularly given local irrigators were experiencing extremely low water allocations.

- A summary of the water restriction applied between 2007 and 2010 is shown in Table 1 below.

Table 15 Water Restrictions Applied in Lower Murray Water Towns

Date	Level
4 December 2006	Stage 1
30 April 2007	Stage 2
4 June 2007	Stage 3
1 July 2007	Stage 4
17 January 2008	Stage 3
9 November 2009	Stage 1
3 October 2010	PWS Rules

- Furthermore, a range of variations and exceptions were permitted/made to the previous By-law over the period 2006 to 2011. These are summarised in Table 2 below.

Table 16 Summary of Variations and Exemptions to By-Law

Date	Variation
4 December 2006	Stage 1
30 April 2007	Stage 2
4 June 2007	Stage 3
1 July 2007	Stage 4
10 September 2007	Hand held watering
15 December 2007	Tree watering
17 January 2008	Stage 3 (Including Rural Customers)
October 2008	New watering times (7-9am & 7-9pm)
10 November 2008	FMID Rural Customers included under By Law for Water Restrictions
1 January 2009	All Rural Customers were excluded from By Law for Water Restrictions
1 January 2009	Lawn watering
4 October 2009	Daylight Savings changes introduced
9 November 2009 (Daylight savings time)	Stage 1 (7-9am, 7-9pm)
9 November 2009 (Non Daylight savings time)	Stage 1 (8-10am, 5-7pm)
3 October 2010 (Daylight savings)	PWS Rules
3 April 2011 (Non Daylight savings)	PWS Rules

13 Drought Response Options

13.1 Introduction

- Drought response options can be classified into two broad categories: demand management and supply enhancement. This section identifies potential demand management and supply enhancement options available to Lower Murray Water.

13.2 Demand Reduction During Drought

- **Summary of Options**

- There are a number of demand reduction options that can be employed during times of water shortage. A summary of these demand reduction options is shown in Table 3 below.

Table 17 Summary of Demand Reduction Options

Option	Details	Comments
Community Education Programs	Water efficiency awareness (showerhead rebates, information brochures), linked to ongoing State Government programs. Estimated savings are around 2-5% of total demand.	Ongoing implementation.
Voluntary Demand Reduction Measures	Self-regulated water efficiency measures aimed at increasing effectiveness of measures within the Permanent Water Savings Plan.	Water savings from this option are expected to exceed the savings already achieved from the Permanent Water Saving Plan.
Major User Water Efficiency	The Government has previously implemented a voluntary program for all non-residential customers with consumption of 5ML/year or greater.	Lower Murray Water to promote this voluntary measure during periods of heightened awareness or during drought response periods.
Mandatory Water Restrictions	Options available under By-Law No. 2.	Revised as per VicWater Guidelines in 2011.
Training of Staff	Awareness of increased responsibilities in supporting customers during drought	May include training of enforcement officers.

- **Voluntary Demand Reduction Measures**

- Voluntary demand measures are an initial measure during the onset of drought conditions. Historically, when water allocations are less than 100%, a corresponding reduction in demand has been observed, despite any formal water efficiency activities.

- Lower Murray Water supports voluntary water saving measures, with initiatives including showerhead exchanges, trigger nozzles and other merchandise. Lower Murray Water aims to encourage its customers to play an active role in managing their water supply and play their part in times of water shortages to ensure efficient use of the precious resource.

- A broad base of local media (press and electronic) can be utilised to raise community awareness of system supply levels and encourage voluntary water saving measures.

- **Major User Water Efficiency**

- That State Government has previously implemented voluntary water management programs for major non-residential customers using greater than 5 ML per year of treated water at any one site from an urban water supply. These programs allowed eligible non-residential water customers to:

- Assess their current water use;
- Identify inefficiencies and opportunities for water savings;
- Prepare an action plan to implement water efficiency actions; and
- Report on implementation of water efficiency actions.

- While funding for these types of water efficiency programs is no longer available, Lower Murray Water will continue working with its major customers to encourage and implement water saving measures.

- **Mandatory Water Restrictions**

- Mandatory water restrictions provide an effective mechanism to reduce urban demand during times of water shortage. Water restrictions are designed to predominately impact on non-essential water uses (for example garden watering and filling of pools), and minimise the impact on the use of water for commercial purposes, public health and essential residential use.

- Lower Murray Water has developed a Schedule of Restrictions in accordance with the Victorian Uniform Drought Water Restriction Guidelines. The restriction schedule has been given legal effect under By-Law No. 2, which is available on Lower Murray Water's website (http://www.lmw.vic.gov.au/Customer-Centre/Water-Conversion/Water-Restrictions-and-Water-Saving-Rules.aspx).

- Lower Murray Water's adopted restriction schedule defines four successive stages of water restrictions. The anticipated water savings under each stage of restriction affects water availability and assists to maintain the required level of water security. The estimated savings for each stage and the associated trigger levels for the implementation of water restrictions are described in subsequent parts of this document. The anticipated water savings for each level of restriction is shown in Table 4.

Table 18 Estimated Savings from Water Restrictions

Stage of Restriction	% Reduction in Demand[1]	% of Restrictable Demand[2]	% of Bulk Entitlement Usage[3]
Phase 1 - Heightened Awareness	5	15	70
Phase 2 – Drought Response			
Stage 1	10	30	63
Stage 2	15	45	60
Stage 3	25	75	53
Stage 4	30	100	49

- Note: 1) % adopted based on generally accepted figure
  2) Based on restrictable demand being 45% of residential demand and residential demand being 75% of total urban demand
  3) Based on Bulk Entitlement being 138% average annual demand in 2021
  4) Refer trigger curves for seasonal allocation covering all months in year (July to June)

13.3 Supply Enhancement During Droughts

- **Purchasing of Permanent Water Entitlements**

- The purchasing of permanent water entitlements will be guided by the longer term objectives as detailed in Lower Murray Water's *Urban Water Strategy 2016-2065*. Permanent entitlements underpin the reliability of the system and over the longer term, the adopted purchasing strategy aims to reduce the risk of water shortages during drier periods.

- **Purchasing of Temporary Water Entitlements**

- The purchasing of temporary water allocations is a key option available to Lower Murray Water. The utilisation of temporary water during relatively infrequent low allocation years provides a cost effective alternative to the full reliance on permanent entitlements.

- **Use of Carryover Water**

- In 2006 the allocation of water in the northern catchments was amended to allow for the carrying over of entitlement volumes. This means that unused entitlement in a year can be carried over to the next year provided certain conditions are are met. The carry over volumes are recorded in a spillable account. If the storages in the system spill then the volume of water in the spillable account is reset to zero. Otherwise the water is available for use in the next season and is added to Lower Murray's bulk entitlement. The total volume of entitlement is then subject to the seasonal allocation. Given that Lower Murray Water aims to maintain its volume of entitlement at about 30% above the average annual demand over the previous three years, in an average year it will not use its full entitlement. If there are reduced seasonal allocations in the next year, any carryover of unused water will assist in reducing the need for the introduction of water restrictions, or at least reduce the severity of restrictions required.

14 Drought Response Action Plan

- This Drought Response Action Plan meets the requirements of Lower Murray Water's *Statement of Obligations* and the LMW Water Restriction By-Law No. 2.

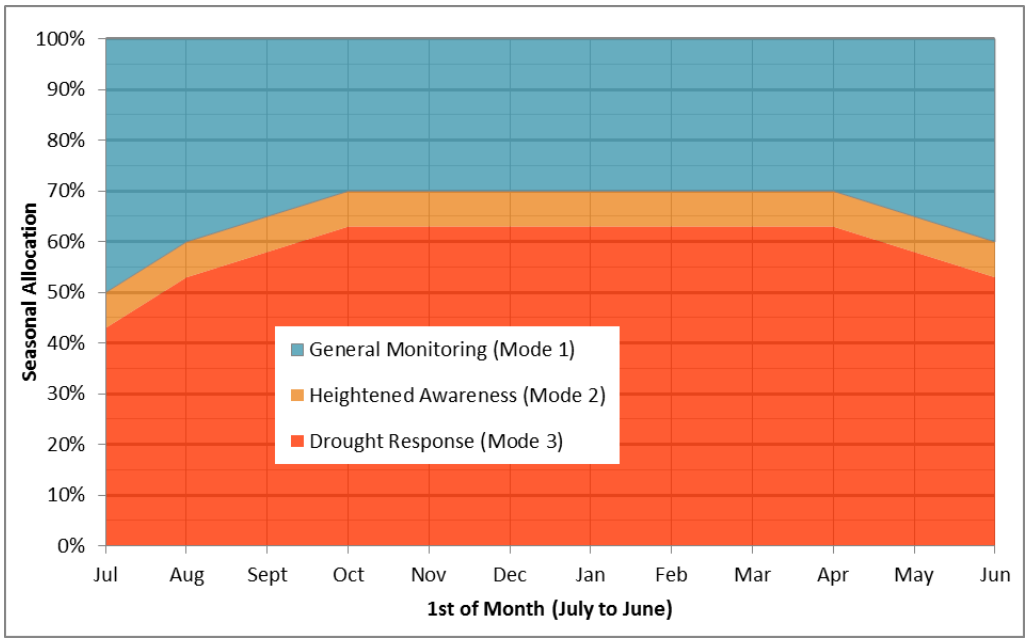
14.1 Operational Phases

- System monitoring will be undertaken to assess the status of the supply system according to one of the following three phases:

- General Monitoring Phase (Mode 1)
- Heightened Awareness Phase (Mode 2)
- Drought Response Phase (Mode 3)

- Drought response mode curves based on the updated Lower Murray Water system demand forecast and current entitlement volume are presented in Figure 1. Further details on triggers and associated actions for each phase are provided in the sections below.

Figure 17 Drought Response Modes based on Seasonal Allocation



Note: Based on the 2021 average annual demand of 20,800 ML and current entitlement volume of 32,431 ML

14.2 General Monitoring Phase Activities

- **Purpose**

- General monitoring phase activities involve Lower Murray Water undertaking general monitoring of system performance to allow for the implementation of drought response actions if required. This section outlines the steps which have or need to be taken to ensure Lower Murray Water is adequately prepared to respond to a drought.

- **Trigger for Phase Implementation**

- The general monitoring phase applies during periods when:

- Existing seasonal allocations are within the Mode 1 operating zone in Figure 1, or
- Access to carryover water is declared.

- **Actions under this Phase**

- Actions included in this phase include:

- Preparation of an Annual Water Outlook (included as Appendix B of the *Urban Water Strategy 2016-2065*);

- Monitoring of Cumulative Water Demand; and
- Adjustment of Water Entitlements

- **Annual Water Outlook**

- The Annual Water Outlook tool is used to monitor supply and demand side aspects of the system. During the general monitoring phase, the system status is updated in November and reviewed monthly thereafter.

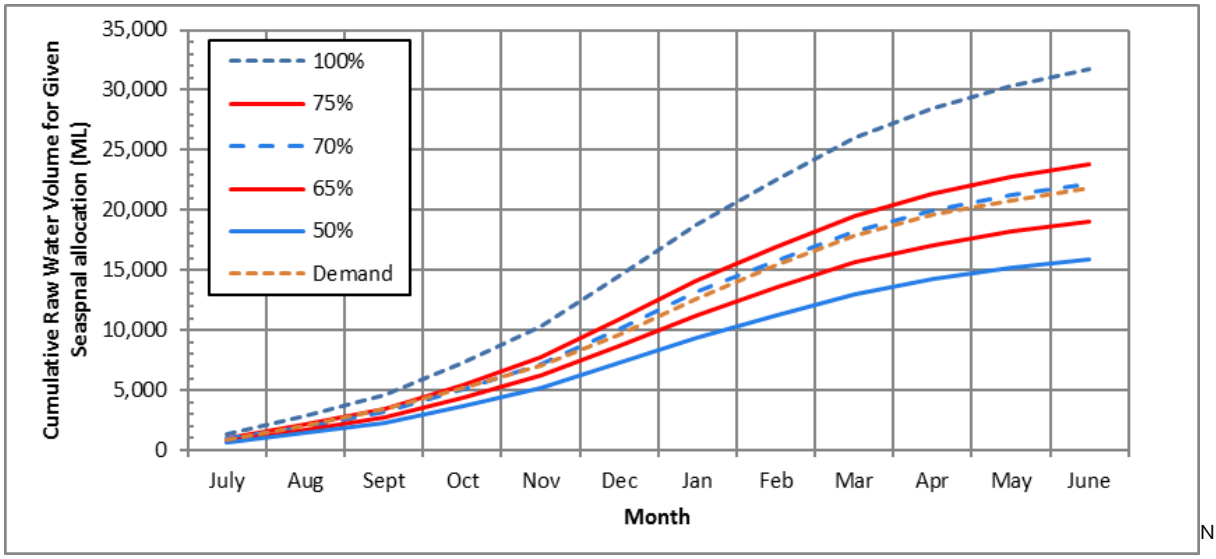
- Undertake forward look projections and document using the Annual Water Outlook (included as Appendix B to the *Urban Water Strategy 2016-2065*). In addition, regularly monitor areas of greatest uncertainty to identify significant departures from the longer term forecasts estimated in the Corporation's *Urban Water Strategy 2016-2065*.

- **Monitor Cumulative Water Demand**

- Lower Murray Water records the volume of raw water demand extracted for the urban water supply systems. This information has been used as a means of determining cumulative raw water demand curves for a range of seasonal allocations plotted on a monthly basis.

- The cumulative raw water demand is plotted against the seasonal allocation curve to determine whether the raw water demand might be on track to exceed the seasonal allocation. The cumulative demand will be monitored and reacted to as the season progresses. Figure 2 shows the cumulative raw water demand curves for specific seasonal allocations based on the current entitlement of 32,431 ML.

Figure 18 Cumulative Seasonal Allocation Curves



Note: Based on the current entitlement volume of 32,431 ML

- **Adjust Water Entitlements**

- Lower Murray Water has the policy of purchasing water entitlement volumes such that the total volume is about 30% higher than the average raw water demand recorded over the previous three years. At the start of each financial year, Lower Murray Water determines whether it needs to purchase water entitlements or reduce entitlements based on the policy defined above. Purchasing additional permanent water entitlements to ensure demand does not exceed the Bulk Entitlement volume is provided for in the annual capital budget allocation. If the entitlement volume can be reduced because it is in excess of that required under the above policy, then Lower Murray Water may choose to temporarily sell water entitlements.

14.3 Heightened Awareness Activities

- **Purpose**

- Heightened awareness activities require more regular monitoring of system performance, with the aim of increasing awareness of pending water shortages among Lower Murray Water staff.

- **Trigger for Phase Implementation**

- The heightened awareness phase applies during periods when:

- Existing seasonal allocations are within the Mode 2 operating zone in Figure 1

- **Actions under this Phase**

- The key actions and responses under the heightened awareness phase are summarised in Table 5, in order of increasing risk of water shortage.

Table 19 Lower Murray Water Drought Action Plan for Heightened Awareness Phase

Action	Trigger	Responses
HA1	Within Mode 2 zone of Figure 1	1. Undertake regular forward look projections; 2. Consider establishing a Drought Monitoring Committee to guide decision making within the Corporation; 3. Prepare public awareness campaign; 4. Train and educate staff;

Action	Trigger	Responses
		5. Consider and or implement options for purchasing temporary water entitlements.

14.4 Drought Response

- **Purpose**

- The Drought Response Phase defines an active drought management period where supply and/or demand side measures are required to maintain supply security. Drought response trigger curves are used to guide the timing of management actions, with management actions and responses during each level of restriction summarised in Table 6.

- **Trigger for Phase Implementation**

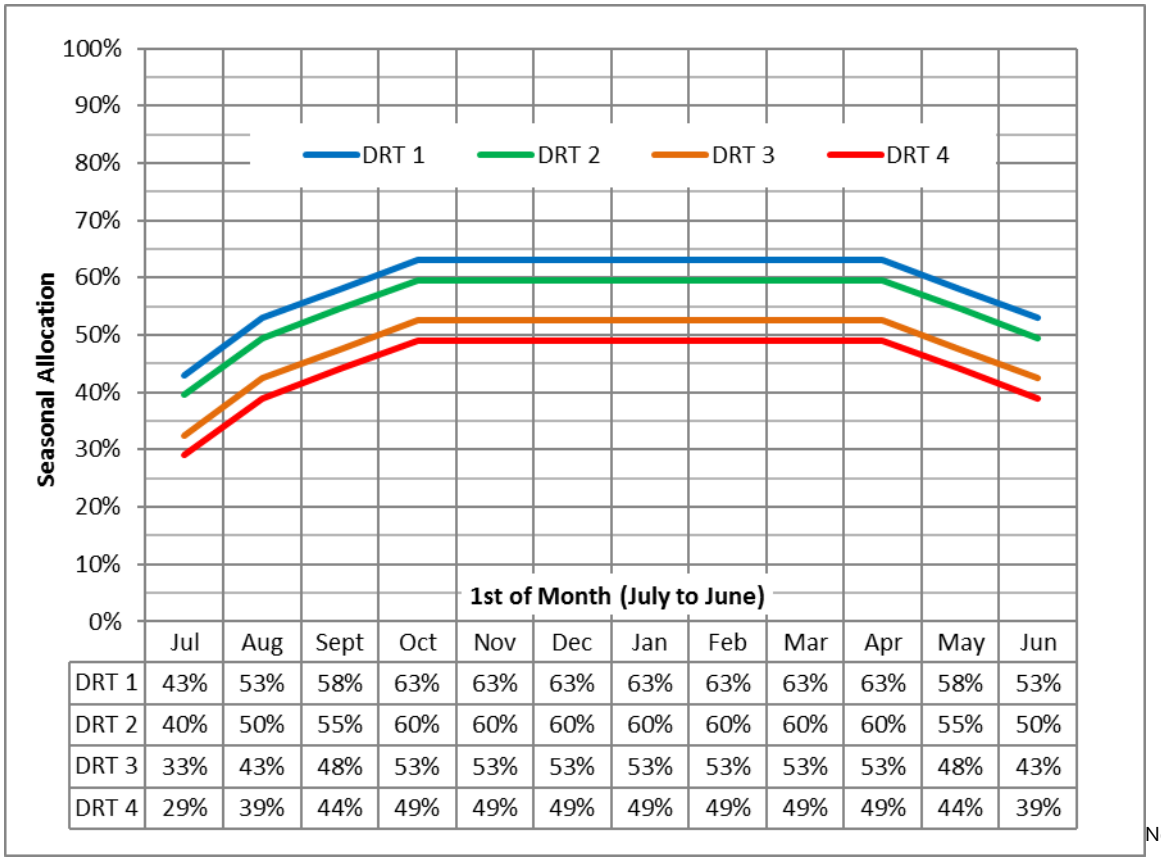
- The drought response phase applies during periods when the seasonal allocation is insufficient to meet the current year demand. For current demands, this applies when:

- Existing seasonal allocations are within the Mode 3 operating zone in Figure 1

- **Trigger for Action Implementation**

- Drought response trigger curves are used to guide the increase or decrease management actions in response to the risk of water shortage.

Figure 19 Drought Response Trigger Curves



	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
DRT 1	43%	53%	58%	63%	63%	63%	63%	63%	63%	63%	58%	53%
DRT 2	40%	50%	55%	60%	60%	60%	60%	60%	60%	60%	55%	50%
DRT 3	33%	43%	48%	53%	53%	53%	53%	53%	53%	53%	48%	43%
DRT 4	29%	39%	44%	49%	49%	49%	49%	49%	49%	49%	44%	39%

Note: Based on the 2021 average annual demand of 20,800 ML, current entitlement volume of 32,431 ML, and the water savings for each restriction level summarised in Table 4

- **Actions under this Phase**

- As drought conditions develop and less than full seasonal allocations are announced, a staged plan of action will be implemented and weekly demand monitoring will commence. The timing of the implementation of restrictions will be based on the results of monitoring progressive seasonal allocation announcements.

- Demand reduction will commence with public awareness campaigns that will highlight the pending drought situation and provide information on wise water use. This campaign will be followed by the introduction of By-Law No. 2 restrictions. The seasonal allocations and cumulative demand verses the seasonal allocation curve will determine which drought response action is current and hence the responses to be progressively implemented.

- A Drought Monitoring Committee will be convened and meet weekly to assess the drought situation in terms of climate data, river flows, seasonal allocations, cumulative water consumption for the year, bulk entitlements, temporary entitlements, actions being taken, and the current or proposed restriction levels.

- Monitoring during a drought will involve a number of separate processes. The frequency of water quality monitoring may be increased if water quality is predicted to be compromised by low flow or long detention times. This information will be used to evaluate the effectiveness of the drought response so that necessary adjustments can be made. All information collected and decisions made will be documented for evaluation in the post drought phase and for use in future drought planning.

- The key actions and responses for the drought response phase are summarised in Table 6 (in order of increasing impact from water shortages).

Table 20 Lower Murray Water Drought Action Plan for Drought Response Phase

Action	Trigger	Responses
DRT1	Seasonal allocation below Level 1 Drought Response	1. Establish public awareness campaign 2. Drought Monitoring Committee meets weekly

Action	Trigger	Responses
	Trigger shown in Figure 3.	3. Consider implementation of Stage 1 Restrictions 4. Introduce advertising campaign using all appropriate forms of media 5. Monitor raw water extraction and perform regular checks of cumulative demand versus seasonal allocation curve
DRT2	Seasonal allocation below Level 2 Drought Response Trigger shown in Figure 3.	1. Consider implementation of Stage 2 Restrictions 2. Continue media advertising 3. Weekly monitoring of raw water extraction and check cumulative extraction against seasonal allocation entitlement curve
DRT3	Seasonal allocation below Level 3 Drought Response Trigger shown in Figure 3.	1. Consider implementation of Stage 3 Restrictions. 2. Continue media advertising. 3. Daily monitoring of storages. 4. Monitor storage volume response and perform regular forward look storage volume projections. 5. Identify and plan for implementation of emergency options.
DRT4	Seasonal allocation below Level 4 Drought Response Trigger shown in Figure 3.	1. Consider implementation of Stage 4 Restrictions; 2. Continue media advertising; 3. Continue weekly monitoring of raw water extraction and check cumulative extraction against seasonal allocation entitlement curve; 4. Implement emergency supply options; and 5. Tanker water to areas of critical shortage.

15 Post Drought Evaluation and Revision

15.1 Evaluation of Objectives

- Once Lower Murray Water lifts the Drought Response Phase, a review of the effectiveness of the DPP should be undertaken. The first part of the review process should be to assess the suitability, appropriateness and achievability of the objectives (i.e. strategic, plan and operational), with each objective being critically reviewed to determine if they were achieved. If they were not achieved, comment needs to be made as to why not, and the objectives refined or new actions set for the next drought event.

15.2 Evaluation of Actions

- **Water Savings**

- The timing and effectiveness of each phase and stage of the four stage restriction regime needs to be assessed and documented. Comparisons between historical deliveries and drought deliveries will be made as part of the monitoring process during the drought. These will be documented as part of the post drought evaluation, and comments and decisions made about the impact of each stage of restrictions during a drought. Trigger levels for each phase and stage of restrictions may then be fine-tuned if required.

- **Impact of Restrictions on the Community**

- Community response to the imposition of restrictions will be evaluated through contact with representatives of the Major Water User Groups, the Customer Consultative Committee and interested individuals. In addition, commercial, accommodation and industrial customers, including nurseries and landscape contractors, will be invited to comment so that any effects on their businesses are fully documented.

- **Impact on Lower Murray Water**

- An examination of the financial and staffing burdens placed on Lower Murray Water during the drought will be carried out. This will allow Lower Murray Water to better prepare itself and its staff for the next drought event.

15.3 Revision

- Drought Preparedness Plans are dynamic in nature and will only be appropriate for a particular system for a short period of time. For the water supply systems operated by Lower Murray Water there is an expectation of continued growth, changing customer behaviour in regard to water efficiency, increased impacts of climate change on allocations, and increased use of alternative water. DPPs need to be updated at intervals of no more than five years and within twelve months of either the lifting of any period of restriction imposed under the DPP or any major change occurring to works or arrangements for conserving water for, or supplying water to, any water supply system.

Appendix B – Annual Water Outlook

Annual Water Outlook - November 2016 to June 2017

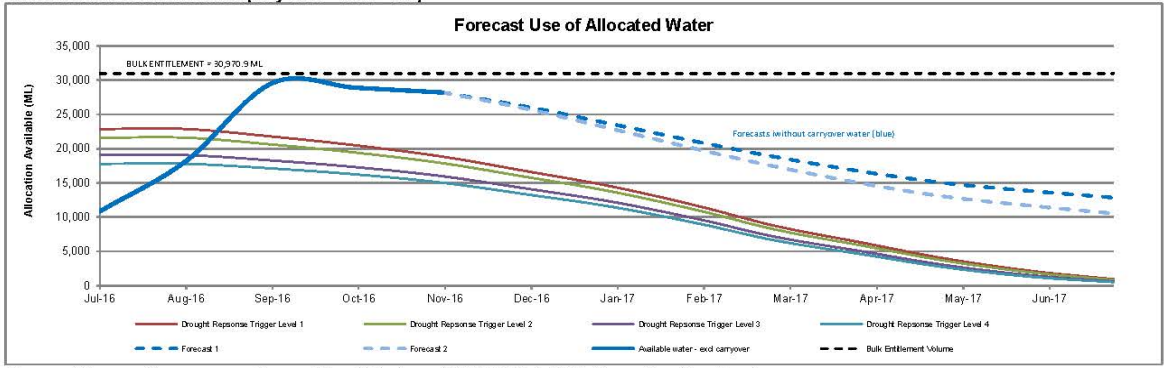
Lower Murray Water

Covering water supply to: Mildura, Red Cliffs, Robinvale, Murrabit, Kerang, Piangil, Koondrook and Swan Hill

System Summary

Lower Murray Water sources about 97% of all raw water from the River Murray, with about 3% (on average) being supplied from the Loddon River and GMW Channel system. Lower mUrrya Water currently holds 30,971 ML of high relaibility water shares in the Murray Regulated system. The large storage capacity in the Murray system relative to Lower MUrray Water's small small demands makes the system relatively secure, and the system is considered to have a low water security risk profile.

Water Year Allocation Outlook (July 2016 - June 2017)



Forecast Assumptions

Forecast 1 = High demand (24,380 ML/a), 100% Murray Allocation without carryover

Forecast 2 = Average demand (21,200 ML/a), 100% Murray Allocation without carryover

Allocation Forecast

Murray system high reliability determinations commenced at 1% on 1 July 2016 and increased to 100% on 3 October 2016.

The Resource Manager Northern Victoria announced on 10 October 2016 that all of the water held in spillable water accounts in the Murray system has been deducted due to the volume of water that has spilled from Lake Hume.

Sources:
http://www.nvrm.net.au/outlooks.aspx
http://www.nvrm.net.au/risk-of-spill.aspx

Overview of System Status

6 month Outlook

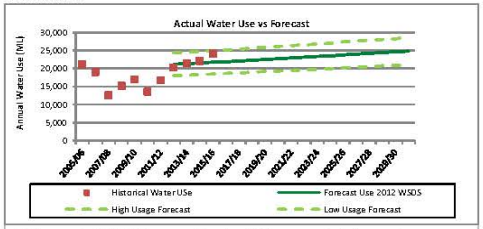
The Mildura region has experienced wetter than average climatic conditions since July 2017 with water consumtpion being approximately 45% lowrr than the same tiome last year.
LMW will have sufficient allocation available to meet the expected demand over the next 6 months, irrespective of further changes in water consumption.

12 Month Outlook

Based on the current resource situation and the expected demands throughout the remainder of 2016/167 LMW systems are expected to be secure over the next 12 months.

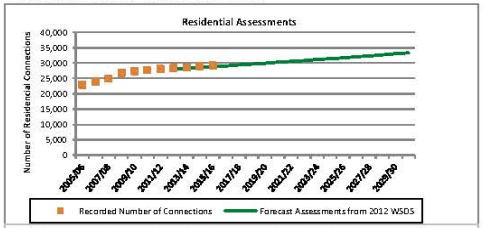
Monitoring Areas of Uncertainty

Water Use



Water use in 2015/16 increased by about 9% compared to the previous year. Total water use remains within the range forecast in the 2012 Water Supply Demand Strategy.

Number of Residential Assessments



Steady growth in connections has been experienced in the Lower Murray area in line with the growth rates forecast in the 2012 Water Supply Demand Strategy.

Action Plan

Actions	Timing	Responsibility
Continue to support uptake of recycled water in Industry and Municipalities and will identify further opportunities with Councils for localised reuse.	2014+	General Manager Techical Services
Implement a range of additional conservation and efficiency measures to reduce per capita consumption.	2013 - 2017	General Manager Techical Services
Investigate system losses and if economically justifiable upgrade related infrastructure.	2014 - 2020	General Manager Techical Services
Commence investigations to assess the feasibility of alternative supply options such as groundwater or desalination.	2020 - 2040	General Manager Techical Services

Appendix C – Consultation and Engagement Plan

URBAN WATER STRATEGY
CONSULTATION AND ENGAGEMENT PLAN
2016-17

LOWER MURRAY WATER

Contents

The Communications Plan comprises the following elements:

1. INTRODUCTION

1.1 Lower Murray Water

Lower Murray Urban and Rural Water Authority was created under the provisions of the Water Act 1989 via Order in Council effective 1st of July 2004. It assumed the whole of the property, rights, liabilities, obligations, powers and functions under the Water Act 1989 of the Lower Murray Region Water Authority and Sunraysia Rural Water Authority. LMW reports to the Minister for Water Ms Lisa Neville.

The Water (Governance Act) 2006 varied the form and title of Lower Murray Water and established new governance arrangements effective from 1st July 2007. Lower Murray Urban and Rural Water Authority is now Lower Murray Urban and Rural Water Corporation.

On 19th August 2008 a Ministerial Determination under Section 87 of the Water Act 1989, appointed Lower Murray Urban and Rural Water Corporation to take over the whole of the functions, powers and duties of First Mildura Irrigation Trust under the Act, including its functions in respect of all of its districts under the Act.

Lower Murray Water's (LMW) core business is to meet the present and future needs of our customers and community by providing reliable and secure water services.

LMW's area of operation extends from Kerang to the South Australian border taking in the municipalities of Mildura, Swan Hill and Gannawarra. LMW provides the region with urban water and wastewater services, treatment and effluent disposal services, river quality water to stock and irrigation customers, along with the collection and disposal of subsurface irrigation drainage water

1.2 Purpose

Lower Murray Water aims to provide relevant, accurate and consistent information to staff, customers and other key stakeholders. The purpose of this Communications Plan is to establish framework for effective information exchange between employees and enable employees to be guided correctly in providing information and communicating with stakeholders and staff. In addition to facilitate ongoing engagement with key stakeholders to provide two way information flow on topics such as water conservation, behavioural change and expectations.

2.0 TARGET AUDIENCES

2.1 Internal Stakeholder Groups

The main target audience for the Communications Plan includes internal stakeholders and Lower Murray Water employees. This Plan must be tailored to address different information needs and learning styles.

Key internal groups are as follows:

- Board
- Managing Director
- General Managers
- Managers and Coordinators
- Operational, Technical and Administrative Employees
- New Employees
- Contractors
- Customer Service Advisory Committees
- Customer Consultative Committee
- Strategic Advisory Committee
- Project Delivery Group (PDG SMP)
- Project Advisory Group (PAG SMP)

2.2 External Stakeholder Groups

Some external mechanisms/activities have been included in the Communications Action Plan.

The external stakeholders identified represent a range of government agencies and community organisations including:

State Government Agencies:

- The Minister, Members of Parliament
- Department of Environment and Primary Industries
- Essential Services Commission
- Department of Health

Local Government:

- Mildura Rural City Council
- Swan Hill Rural City Council
- Gannawarra Shire Council
- Wentworth Shire Council (NSW)
- Wakool Shire Council

Service Authorities:

- Mallee Catchment Management Authority
- Goulburn-Murray Water
- Vic Roads
- Powercor Australia
- Telstra
- Murray Darling Association
- Southern Rural Water
- GWM Water
- Murray Darling Freshwater Research Centre
- Local Land Services Western (NSW) *[formerly Murray Darling Catchment Management Authority]*

Other

- Customer Committees
- Print and broadcast media
- Indigenous groups
- General Public
- Complainants
- People of non-English speaking backgrounds
- Elderly members of the community
- Accommodation and Tourism Industry
- Industry
- Residents
- Community groups
- Schools
- Grower groups
- WaterMAP customers
- Vic Water

3.0. AIMS & OBJECTIVES

3.1 Aims

Internal

- Ensure a positive, customer friendly team environment exists
- Show respect and professionalism between team members
- Improve skills by undertaking applicable training
- Ensure all activities are undertaken in accordance with relevant OH&S policies and procedures
- Share information between team members and the broader authority
  Educate the community while being efficient and cost effective with resources

External

- Generate positive awareness of water conservation and relating topics
- To communicate the relevant information to a wider community and educate those who may benefit
- Develop partnerships with local businesses and groups to education on water related issues

3.2 Objectives

Internal

- To communicate specific responsibilities relevant to employees and their work relating to Communications and water issues
- To engage with, involve and motivate employees in communication issues
- To demonstrate a commitment to effective communications with LMW and its employees
- To create a positive and encouraging team environment

External

- Ensure the rapid and accurate dissemination and receive information of importance to, or of interest to, LMW and its customers
- Increase awareness and understanding of water related issues in the entire community
- Develop partnerships with local businesses and groups to education on water related issues
- To communicate the relevant information to a wider community and educate those who may benefit
- To identify and publicise best practices and success stories in relation to water conservation
- To provide communications support for work groups, activities, customer groups, community groups and industry

4.0. COMMUNICATION TOOLS

4.1 External Communication Tools

Publications:

- Annual Report
- Charter Summaries – updated as required
- Customer Charters (Urban & Rural) updated
- Dripster – Activity book
- Fact Sheets Stage 1 – 4 (Inc General Exemptions)
- General Customer update brochure
- Greywater in the home – Reformat and print (used during higher levels of restrictions)
- Living with an untreated water supply – rural
- LMW Customer Update – brochure (DL version)
- Managing and Monitoring your water consumption – Rural
- Managing Your Water Bill - Urban
- Managing your water consumption – urban
- Media Releases
- Monitoring Your Water Consumption – Urban
- Monthly e-news newsletter "Inflow"
- Newsletters (contributing to other agencies' newsletters)
- Permanent Water Saving Rules Fact sheet (in line with State requirements or other data as required)
- Rural newsletter (distributed quarterly)
- Staged Restrictions – Your Guide to Staged Water Restrictions
- Water Ordering Guide – reformat in line with new site
- Water Wise Garden brochure
- Your account explained
- Your Guide to Permanent Water Saving Rules
- SMP – factsheets and DL Brochure

Electronic Media Tools

- Advertising – Specific topics
- Use of all advertising mediums – Radio, Television, email
- Continuing upgrading of LMW Website as required
    - Update to watering ordering section
    - I-phone friendly
- Bulk emailing to rural and urban customers
- SMS capabilities – rural & investigate for urban customers
- Facebook ('Like us' prize draw)
- Twitter
- Annual Customer Survey

Awareness Communication Tools

- Competitions
- Corflute signs – "Proudly Sponsored by LMW"
- Primary School Education Programs:
    - Dripster Super Water Saver (Complete program)
    - Dripster Super Water Saver (Modules)
    - Tailored presentations and resources
- Education program - Resource Smart AuSSI Vic (for schools)
- Encouraging correct application of water use – sprinklers, trigger nozzles
- Exchanges – trigger nozzles, showerheads
- Giveaways – tap timers, shower timers
- Incentive programs – Government Rebate Schemes (eg: Living Victoria Water Rebate Program currently running to 30th June 2015)
- Posters on conservation topics
- Pull up banners
- MRCC/LMW water 'bubbler' trailer

Educational Awareness

- Community Water Refill stations
- Do no drink – signs and stickers
- 'Dripster' Character utilisation:
    - Activity Booklet
    - Board game (large and table-top sets)
    - Pencil sets
    - Posters
    - Pull up banner
    - Refillable drink bottles
    - Rulers
    - Super Water Saving Program (and modules option)
    - Temporary Tattoos/Bookmarks
- Environmentally Friendly Bags
- LMW Caps
- LMW Marquees
    - Large
- Newsletters (urban and rural)
- Pens
- Polos for Communications staff – Dripster character

- 'Rehydrate with Cool, Clean Tap Water' campaign
  - Refillable drink bottles (sporting groups)
  - Glass bottles (restaurant program)
  - Pull up banners and supporting materials
- Shower hooks
- Shower timers
- Sponsorship/Donations
- Tap timers
- Trigger nozzles
- Water conservation – stickers (tourism, business and schools)
- Water conservation - students participating in Dripster program

Informative Communication Tools

- Information sessions – Board Forums
- Participation in public/community events
- Power point presentations
- Focus group testing – CSAC and CCC
- Conferences
- Public forums
  - targeting specific groups
  - open forums
  - displays

4.2 Internal Communication Tools

- Annual end of year function
- Annual mid-year function
- Annual Report
- Annual staff awareness sessions
- Face to face contact with management
- Frequent staff updates/meetings/emails
- Induction for staff – on line
- Internal staff newsletter
- Intranet
- Intranet upgrade and maintenance
- Staff debriefs (on topics as required)
- Toolbox meetings

5.0 Communication Internal & External Action Plan

Table 1 Identified opportunities and Short term activities

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Corporate Relations		
Work with local business / /Government for joint presence at relevant conferences and other events. Display banners at all events and conferences.	Through website and meetings Opportunities to share booth space /activities at events - Mildura Show (October) - Field days in our region (various) - Sunfest (bi-annually; next to be held 2016) - Mildura Tourism Week (May) - Seniors Week (October) - National Water Week (October) - World Environment Day (June) - Clean Up Australia Day (March) - World Water Day (March) - World Wetlands Day (February) - Home Show - Annual conferences	CRO CSO MCE (Other staff as appropriate)
Face to Face Communications		
Meetings with stakeholder groups on urban & rural water related issues	Set up meetings and agenda for face to face meetings. Meetings with both urban and rural customer committees held throughout the year	CRO MCE
School liaison and education	Present information on various water related topics to class groups, as per requests from teachers as they are received	CRO CSO
School Liaison and education through Dripster program	Promote knowledge of environmental issues and water conservation relative to the national curriculum; using Dripster character. Includes a resource kit provided to schools for teachers to conduct activities.	CRO CSO EnvO
	The Modules option of the Dripster Program is available to schools as of June 2014. Each year group has a choice of two modules plus the use of the Board game	CRO CSO EnvO
Dripster "Board Game"	Board game available for schools in a table top format and large scale 4mx5m game board. Game to be used by LMW at events (such as Mildura Show). Table top format (4 sets) will be available for borrowing by schools as part of the Dripster 'modules' option	CRO MCE

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Publications / Signage / Promotional items		
Style Guide for all corporate publications relating to water conservation and restrictions	Review all publications to ensure uniformity, accuracy and relevance - All brochures, advertisements, publications must conform to the LMW Style Guide - Correspondence style guide – letters, faxes, memo's etc	CRO to review on an annual basis SAO - CS
Update existing publications as required (all publication to be available on website)	- Managing Your Water Bill – Urban	Send out to all customers via bills as required CRO
	- Monitoring Your Water Consumption - Urban	Updated August 2012 Review CRO
	- Water Ordering Guide	Update EIO
	- Your account explained	Updated CRO
	- Managing and Monitoring your water consumption – Rural	Update October CRO
	- Customer Charters (Urban and Rural)	To be updated when Water Plan approved EO CS
	- Charter Summaries	
	- Your Guide to Permanent Water Saving Rules	Updated and made available electronically - internet
	- Fact Sheets – Stages 1-4	Update if/when restrictions change CRO
	- PWSR Fact Sheets	Update as required CRO
	- Staged Restrictions – Your Guide to Staged Restrictions	Update as required CRO
	- Annual Report	Prepared Annually (May-Sept)
	- Media Releases	Issued as required
	- Newsletters (other agencies)	Information submitted upon request CRO
	- Monthly e-news ("Inflow")	Issued monthly CRO
	- Quarterly Rural Newsletter	Issued quarterly SAO CS
	- Dripster Activity Booklet	Reviewed annually
Community engagement and promotional education	- Community Water Refill Stations	Installed at various locations Including Mildura Waves pool area And externally – front door. Investigate other possible venues Including river front/marina and Langtree Mall.
	- Rehydrate Program – schools, local businesses, sporting clubs	Drink bottles available for sporting clubs, glass bottles available for restaurants, education materials available for schools

Commitment	Procedure/Action	Responsible officer(s)/Timeframe
Publications / Signage / Promotional items CONTINUED		
Identification cards with photos for all contractors	Develop id cards for all contractors with wording from the Water Act. (Ongoing)	CRO AO CorpS
Improve accessibility to communications for the public	Larger print versions of brochures made available on request, Braille, EAL, taped, video, voice activation on website etc Video link set up for new website – awaiting further information from Saunders Design	CRO As part of review of website October – November 2012
Customer survey	Sent out annually to urban and rural customers 5% of customers for Urban and all rural customers, also the top 50 highest consumers	CRO
Consider hard to reach groups when communicating messages about water conservation and restrictions	Develop more targeted communications. Take into account non-English speaking groups etc. Website to be more user friendly for non English speaking community. Mouse rollover speech function available on new website	CRO As part of October/November website
Government Relations, Strategies & Initiatives		
Monthly Progress Reports/Good news stories to Government	Report to the Minister on monthly water consumption figures, community information sessions on water conservation, good news stories, local issues etc	CRO
National Framework – Rural Enforcement & Communications Strategy	Liaise with DEPI in relation to the development of the National Framework for communications and compliance for Rural customers	2014 EO CS, CRO, GM CS
SMP	Interaction between LMW and SMP relating to media and customer contact. This also includes approval processes for DEPI relating to media contact.	CRO GM CS
Media Relations		
Continue to work on media protocols/Policy - Media Releases - Speaking to the media (tv, radio etc)	Increase awareness/ involvement in communications with media to develop a better relationship and a mutually beneficial partnership. Refer staff to Board policy in relation to "dos and don'ts" for speaking to the media and writing media releases etc	CRO GM CS MD

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Community Relations & Event Management		
Rural Water Awards	Work with Vic Water (as Project Manager) and other Water Corporations/agencies to promote the regional and State Awards (held bi-annually) - Southern Rural Water - Lower Murray Water - Goulburn Murray Water - Melbourne Water - Coliban Water - Victorian Farmers' Federation - DEPI - Minister's Office	CRO
Community information / open day sessions	Tours of Major Projects as appropriate • SMP	CRO As needs basis
Annual Shows • Mildura • Swan Hill	Use as an opportunity to promote the water conservation message. LMW to support these events by providing giveaways and information etc (In kind support) where possible *[October 2013 – Naming rights "The Lower Murray Water Floral Competition" $400 cash donation]*	CRO Annual basis
Field Days – attendance and/or support	Southern and Northern Regions. Assessed on an event-by-event basis, LMW to be involved in the field days by offering support in the way of information and prizes / giveaways and/or attending events where appropriate	CRO
Mildura Tourism Week	LMW to be involved in Mildura tourism week by assisting or participating in the activities being held that week (in-kind support)	CRO Mildura Tourism
National Water Week October	Activity at the Mildura Show combining local agencies (including: Waterwatch, Riverwatch, MRCC, LLSW, Landcare, LMW, EnviroEdu). This is done pre-NWW to take advantage of show infrastructure Activities for school students to participate in relating to environmental and water education (one hour session for each class)	CRO EO CS EnvO CSO Conducted on an annual basis
	National poster competition promoted to Primary Schools in our Service Region	CRO CSO Conducted on an annual basis
	Assistance and participation where appropriate in other agencies activities during National Water Week	CRO CSO Conducted on an annual basis
Ground Water Awareness Week	LMW to encourage awareness within the community by promoting environmentally related issues within the community and/or assisting with other agencies events. Ground Water Awareness Week is held annually in March	CRO CSO EnvO

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Community Relations & Event Management CONTINUED		
Sustainable Waste Management Events	We encourage all groups seeking sponsorship/donation from LMW to hold their event as a "Sustainable Waste Management" event. This replaces the "Wastewise Accreditation"	CRO
Giveaways of water wise items	Continuation of giveaways of water wise products throughout the year as required	CRO CSO
Competitions	Design and run various competitions throughout the year to promote various water conservation themes	CRO CSO
Foyer displays (electronic - tv and static displays)	Update foyer displays as/when required. Reviewed monthly	CRO
World Environment Day	LMW to encourage awareness within the community by promoting environmentally related issues within the community and/or assisting with other agencies events. World Environment Day is held annually on the 5th June	CRO CSO EnvO
Business Excellence Awards (new format – in conjunction with Regional Development Corp)	Bi-annual event Sponsorship Swan Hill & Kerang	CRO GM CS
World Wetlands Day	LMW to encourage awareness within the community by promoting environmentally related issues within the community and/or assisting with other agencies events. World Wetlands Day is held annually on 2nd February	CRO CSO
Sustainability Festival	LMW to provide information to the community at the event. Bi-annual event last held March 2014	CRO CSO
Seniors Festival	Held annually in October - LMW to participate by offering information to the community members involved. Static displays and sponsorship also be offered	CRO CSO
	A morning tea event to showcase the Fourteenth Street water wise garden and general gardening issues. Information on the plantings; giveaways and guest speakers are part of the two hour event.	CRO EO CS CSO
Clean Up Australia Day	LMW to encourage awareness within the community by promoting environmentally related issues within the community and/or assisting with other agencies events. Clean Up Australia Day is held annually in March	CRO CSO EnvO
World Water Day	LMW to encourage awareness within the community by promoting environmentally related issues within the community and/or assisting with other agencies events. World Water Day is held annually in March	CRO CSO EnvO

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Electronic Communications		
Media Releases	Seek publicity through media to promote activities and events in order to increase public awareness on issues such as - PWSR - Good news stories relating to water or LMW - Key events - Dripster programs - Major Projects - Specific projects or events Keep staff up to date with issues and events involving LMW, encourage feedback from staff and the community on providing information. Protocol to be made available via intranet	GM CS & CRO to email to staff MRs on an ongoing basis
Email Signature – Style guide	Continue to monitor email signatures across the businesses for all staff to implement. Emails must contain a 'subject' to improve information flow (eg: Subject lines not to be blank). Style guide for email signatures (set up on employment commencement)	CRO GM CS
	Style guide – correspondence. Letters, faxes, memos etc to be made available for all staff	SAO – CS
Powerpoint template	Two versions now available for all staff and directors (white background or blue background). Made available via internal drives and emailed out to Directors and Management.	CRO
Survey Monkey - staff	Surveys to be conducted regularly on issues of interest to seek feedback from staff and customers	CRO HR IT Dept
Survey monkey – annual customer survey	Convert paper survey over to electronic survey available on LMW website homepage and water ordering site. - Generic email and SMS to be sent to all customers (rural) - Generic letter sent to urban customers advising of the survey being available on our website. - Email sent to all urban customers registered to receive monthly e-news. - Hyperlink sent within the sms for rural customers (Survey Monkey platform is i-phone compatible)	CRO, EO CS,
Intranet site	Restructure concluded. Encourage feedback from staff and the community on our services	IT Dept CRO

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Electronic Communications CONTINUED		
Internet Site Ongoing maintenance and upgrades Social Media	Keep all Water Restriction information current on new site. Review all frequently asked questions (FAQ's) on a regular basis to ensure accuracy and relevance. Investigate incorporating social media into new website including RSS, YouTube	IT Dept CRO
Social Media - Facebook	Competition to be arranged to "like" our site Weekly prize draw for water wise bucket of goodies for customers who "like" our page. Comments are restricted on the page.	GM CS CRO
Social Media – Twitter	Create a strong link with Facbook and twitter. Encourage customers to like and follow LMW to ensure instant information is available rather than relying on media.	GM CS CRO
Issues and Crisis Management		
Maintain a Strategic Plan for issues such as • Contamination/Algae outbreaks • Staged Water Restrictions • Emergency shutdown / power outages • Flooding • Terrorism	Review all Emergency Media Release templates, television commercials and radio adverts (annually) Develop fact sheets relating to all topics that can be loaded onto the website Update when new Managing Director appointed	CRO
Terrorism Response Training	Participate in annual internal Terrorism Response Training as required	GM CS CRO SAO CS EO CS
Blue Green Algae • for non – potable water (Channel systems and rivers) • General public Non-potable water	Maintain and update brochure/fact sheet and web page regarding BGA: • How to identify it • What to do Work with Mildura Tourism to help tourism operators with dissemination of information. Information sheets, website information and daily updates available (as needed) Posters – MDBC Fact Sheets have been developed Update the fact sheet regarding the use of non-potable water and the use of tanks for D&S supply during blooms.	CRO GM CS NRO GM CS

Commitment	*Procedure/Action*	*Responsible officer(s)/Timeframe*
Employee feedback opportunities and related issues		
Staff Induction & Staff Awareness Sessions	Every new employee to receive an induction on LMW, including information on Water Restrictions. Staff induction days to be held regularly to assist staff to better understand the business and its functions. Contractors to be included in induction day. GM CS to discuss policy on staff speaking to media etc Online induction portal	CRO and relevant departments to provide presentations HR IT Dept
Regular staff training	Staff training sessions to be run on a regular basis to ensure correct information is given to the public on Water Restrictions/topical issues such as SMP	PDG CRO
Email/SMS notices for rural customers	Maintain the email database for rural customers to enable bulk mailing of newsletters, important notices, power outages etc. Set up an urban database to enable the same for potable water customers Competition or portal on website for customers to enter mobile number and account number	GMCS CRO IT Dept

Staff abbreviations used above. Position incumbent as at June 2014 shown for ease of reference only.

Abbreviation	*Title*	*Incumbent as at June 2014*
AO CorpS	Admin Officer – Corporate Services	Yeshni Purchase
MCE	Manager Communications & Engagement	Leesa Merrett
CSO/ CRO	Customer Services Officer	Margot Fowler
EIO	Engineer, Irrigation Operations	Ailsa Willis
EnvO	Environmental Officer	Andrew Lush
EM CS	Executive Manager – Customer & Stakeholder	Andrew Kremor
GMCS	General Manager – Customer Services	Owen Russell
HR	Human Relations	Janet Dawes, Chris Antonie, Joe Barber as appropriate
IT Dept	IT Department	Allan Ball, Sung Liang, David Rohrlach, Zac Amos as appropriate
MD	Managing Director	David Girdwood
NRO	Natural Resources Officer	Fiona Murdoch
SAO CS	Senior Administration Officer – Customer Services	Fiona Newberry

3.0 Calendar

July

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Progress Rural Water Awards as required
- Mid-year Function – LMW Northern Staff
- Customer Survey distributed – Urban & Rural
- Continuation of preparation of Annual Report
- Continuation of preparation of National Water Week multi-agency activity at Mildura Show
- Prepare report against Communications Plan (budget versus actual and activity evaluations)
- Launch new Facebook page

August

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Progress Rural Water Awards as required
- Review of brochures as required
- Continuation co-ordination of National Water Week multi-agency activity at Mildura Show
- Continuation of preparation of Annual Report

September

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Rural News distributed
- Completion of Annual Report
- Accept entries and locally judge National Water Week Poster Competition
  Continuation of preparation of National Water Week multi-agency activity at Mildura Show

October

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required

- Sponsorship and donations as required
    - Mildura Show – Elliott Emu Trail, Flower Pavilion
    - Seniors Week – various support including event at LMW
- Involvement with Seniors Week through Seniors' "Morning Tea in the Garden
- National Water Week October)
    - "National Water Week on Show " as part of the Mildura Show
    - Local poster competition winners announced and prizes presented
    - Involvement in other agencies' activities as required

November

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required

December

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Prepare and conduct presentations at schools as required
- Prepare and print LMW Customer Update (DL)
- Major projects update – Linked to the SMP
- LMW Northern Staff Christmas Party
- Monitoring for Blue Green Algae; and information dissemination (as required)
- Attend Rural Water Awards Ceremony in Melbourne

January

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Prepare and conduct presentations at schools as required
- Rural News distributed
- Monitoring for Blue Green Algae; and information dissemination (as required)

February 2015

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Participate in World Wetlands Day; as appropriate
- Sponsorship of Sunraysia Murray Group Training (SMGT) Gala Awards
- Monitoring for Blue Green Algae; and information dissemination (as required)

March

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Participate in World Water Day as appropriate
- Participate in Clean Up Australia Day (focus on Murray River and environs) as appropriate
- Participate in Ground Water Awareness Week as appropriate
- Monitoring for Blue Green Algae; and information dissemination (as required)

April

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Monitoring for Blue Green Algae; and information dissemination (as required)

May

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Commencement of preparation of Annual Report
- Compile quotations for promotional merchandise options for 2014/15 internal budgeting
- Involvement in Mildura Tourism Week, as appropriate

June

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Participate in World Environment Day as appropriate
- Continuation of preparation of Annual Report
- Participate in annual internal Terrorism Response Training

July

- Reporting to Minister for Water
- Internal reporting to Board/Management
- Distribution of LMW E-newsletter "In-flow"
- Distribution of media releases as required
- Assess sponsorship and donations as required
- Updating of foyer display as required
- Updating of website as required
- Continuation with involvement in *ResourceSmart Australian Sustainable Schools Initiative Victoria (AuSSI Vic)* program as required
- Process Living Victoria Water Rebate Programs applications as required
- Assist with the co-ordination of CSAC / CCC / SAC meetings as required
- Conduct site educational site tours as requested
- Prepare and conduct presentations at schools as required
- Mid-year Function – LMW Northern Staff
- Customer Survey distributed – Urban & Rural
- Continuation of preparation of Annual Report

Appendix A

Publication/Promotion	***Action***	**Responsibility**
1. Newsletters "e-news" Upload media releases, newsletters and video etc via LMW site, facebook and twitter.	Regular newsletters to the community and staff reporting on progress of staged water restrictions and relating topics, education on specific issues of interest etc. Ensure the publication is well circulated across the region as well as being available via our website. Newsletter to contain info such as: - River and storage levels - Water conservation ideas in the home - Specific restriction information - Major projects and events	CRO
2. Customer Survey - Annual	Annual survey sent our electronically to customers including urban, all rural and commercial. Mail out including the survey monkey link directing customers to complete the survey.	CRO
3. Community Water Refill Stations	Investigate location for 1 x outdoor unit to be installed in Kerang in 2014/15 year	GM CS CRO
4. Rehydrate with cool, clean tap water • Sporting clubs • Restaurants	Continue with programs on an as-requested basis	CRO
5. Resource Smart AuSSI Vic program	Provide resources and/or class presentations to support this program as requests received	CRO CSO
6. Foyer Display	Reviewed monthly, update as required	CRO
7. Dripster Education Program	Program being updated from feedback received. Full revised program expected to be available as of July. When completed; resources will be provided to schools on an as-requested basis Modules option completed June. Provide resources to schools on an as-requested basis	CRO CSO
8. Rural Water Awards	Continue to participation in awards as required:	CRO CSO

9. Educational /promotional items	Produce promotional material for giveaways at events such as Mildura Show, Seniors' Festival, National Water week; and for use in various competitions and sponsorships. T-shirts, pens, hats, drink bottles, mini flyer pros, pencil sets, temporary tattoos/bookmarks etc Tap times, showergheads, trigger nozzles etc	CRO
10. Sponsorships/Donations	Continue with Sponsorships/Donations program in line with LMW guidelines and budget. Water wise promotional merchandise provided where possible	CRO CSO
11. Participation in awareness 'days' activities	Participate as appropriate in events to support other agencies' activities regarding awareness 'days' eg: Clean Up Australia Day, World Environment Day, World Water Day, Ground Water Awareness Week	CRO CSO
12. National Water Week	Continue support of annual awareness week through running poster competition and co-ordinating and participating in the multi-agency event held at the Mildura Show	CRO CSO EnvO EO CS
13. Promotion of the LMW Facebook and twitter pages	Encourage customers to link and follow our pages to establish a direct link to customers rather than relying on media. A prize draw (weekly/monthly) to encourage customers to visit our site	CRO GM CS

7.0 BUDGET

Activity	**Budget**
Water education	**$50,000 per annum**
Digital based education programs	*$20,000 per annum*
School based education programs	*$10,000 per annum*
Other streams of community information and education	*$20,000 per annum*

8.0 POLICY & PROCEDURES

Rev No	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date

Draft	L Corless	Owen Russell	*	Owen Russell	*	
Final	L Corless	Owen Russell		Owen Russell		1/9/08
Draft	L Corless	Owen Russell		Owen Russell		16/6/09
Draft	L Merrett	Owen Russell		Owen Russell		2010
Draft	L Merrett	Owen Russell		Owen Russell		Sept 2011
Draft	L Merrett	Owen Russell		Owen Russell		Aug 12
Draft	L Merrett	Owen Russell		Owen Russell		24/06/14
Final	L Merrett	L Merrett		A Kremor		1/4/17

* denotes signature on original